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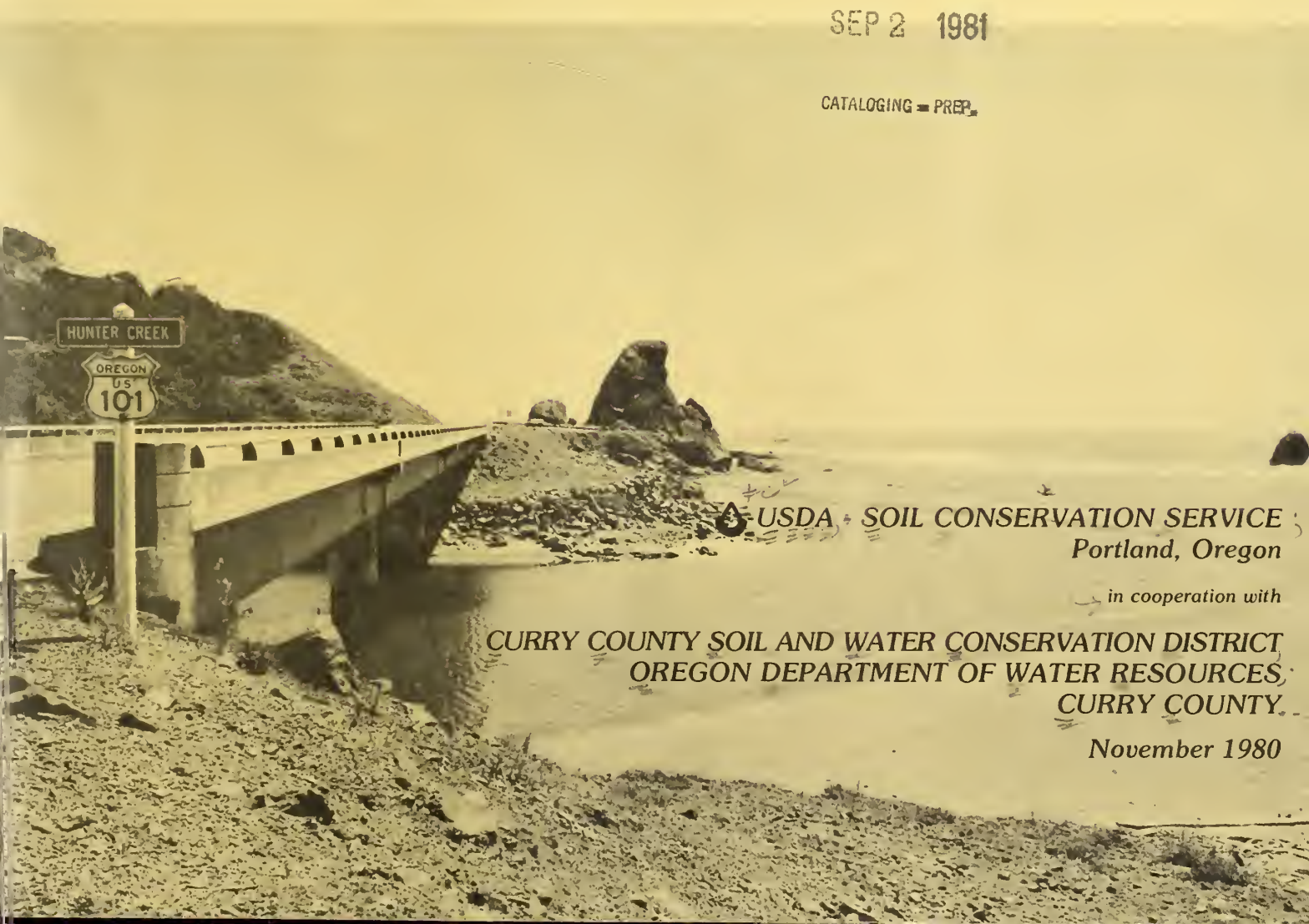
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**FLOOD HAZARD STUDY,
HUNTER CREEK,
Curry County, Oregon**

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**CURRY COUNTY SOIL AND WATER CONSERVATION DISTRICT
OREGON DEPARTMENT OF WATER RESOURCES,
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HUNTER CREEK FLOOD HAZARD STUDY

FOREWORD

The Hunter Creek Flood Hazard Study is an analysis of the flooding conditions on the lower 6.8 miles of Hunter Creek.

The hydrologic analysis was performed using historic precipitation, streamflow and flood information. Peak discharges, developed through hydrologic studies were used in the hydraulic analysis. The elevations of various frequency floods were determined. The information used in the different analyses are the conditions as they are in 1980.

The Hunter Creek Flood Hazard Study was prepared by the Soil Conservation Service, U. S. Department of Agriculture, in cooperation with the State Water Resources Department, Curry County, and Curry County Soil and Water Conservation District.



LEGEND

- WATERSHED BOUNDARY
- STUDY AREA AND LIMIT
- NATIONAL FOREST BOUNDARY



HUNTER CREEK WATERSHED CURRY COUNTY, OREGON

SCALE IN FEET



CONTOUR INTERVAL 80 FEET



OREGON

SOURCE: Base map is from U.S.G.S. 7 1/2 minute quadrangle, 1934
Thematic detail prepared by the Oregon state staff.

FLOOD HAZARD STUDY

HUNTER CREEK
CURRY COUNTY, OREGON

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FLOOD HAZARD STUDY
HUNTER CREEK
CURRY COUNTY, OREGON

INTRODUCTION

STATE AND LOCAL NEEDS FOR THE STUDY

Many homes are located along Hunter Creek within the study area. There is increasing probability of homes being built in the floodplain. The information developed in this flood hazard study will help in the effective management of the floodplain. A well managed floodplain can reduce damage to property, reduce mental anguish and save lives by controlling the location of property and its susceptibility to flooding. Curry County presently has a floodplain ordinance in effect. This study will give the data to more effectively implement the floodplain ordinance. This study as it was developed, will meet the requirements of the Federal Emergency Management Agency (FEMA) for Floodplain Insurance Studies.

REQUESTING AND PARTICIPATING AGENCIES

The Curry County government asked the Soil Conservation Service (SCS) to prepare a flood hazard study for Hunter Creek. The Curry County Soil and Water Conservation District (SWCD) and the State Water Resources Department (SWRD) endorsed this request. Work was begun after a Plan of Study (POS) was prepared and signed in April 1979. The flood hazard study was performed in accordance with the Joint Coordination Agreement between the SCS and SWRD of April 1979.

STUDY AUTHORITIES

Flood hazard studies are carried out by the Soil Conservation Service as an outgrowth of the recommendation in a report by the Task Force on Federal Flood Control Policy, House Document No. 465 (89th Congress; ordered printed August 10, 1966), especially recommendation 9 (c), "Regulation of Land Use."

The authority for funding flood hazard studies is Section 6 of Public Law 83-566, the Watershed Protection and Flood Prevention Act, which authorized USDA to cooperate with other federal and with state and local agencies to make investigations and surveys of the watersheds of rivers and other waterways as a basis for the development of coordinated programs.

In carrying out flood hazard studies, SCS is also being responsive to Executive Order No. 11988, dated May 24, 1977. Section 2(c) of this Order states: "Each agency shall take floodplain management into account when formulating or evaluating any water and land use plans..."

DESCRIPTION OF STUDY AREA

UPSTREAM DRAINAGE AREA

The Hunter Creek watershed is located in the southwestern portion of Oregon. It is part of the southern Oregon unit of the Pacific Slope Basin within the Pacific Northwest Region. Hunter Creek is part of the accounting unit 17100312, as designated in the U. S. Geological Survey Hydrologic Unit Map. It drains into the Pacific Ocean at a point approximately 3 miles south of Gold Beach in Curry County, Oregon. Approximately 44 square miles is drained by the Hunter Creek watershed which is about 10 miles long and 5 miles wide. The highest point in the watershed is Sugarloaf Mountain at 3560 feet. Approximately one-third of the watershed is in the Siskiyou National Forest. Major tributaries to Hunter Creek are Conn Creek, Little South Fork, Big South Fork, and North Fork. Stream flow is generally east to west. The hillside slopes within the watershed generally are 15 percent or greater while the stream slope runs between 2 and 10 percent. The lower 2½ miles of the stream has a slope of less than 1 percent in a wider valley.

The geology of the watershed is of the late Jurassic Period. The area is primarily in the Otter Point Formation with higher areas of the watershed in serpentine and peridotite mineral groups. The Otter Point Formation is a heterogeneous grouping of sandstone marine basalt, metamorphic blocks, conglomerate and minor chert. The valley floor in the lower portion of Hunter Creek is of recent alluvium deposits. Beach sand and stable dunes are found at the outlet of Hunter Creek. The soils in the Hunter Creek area are generally of the Orford Association which are strongly sloping to very steep soils deep over siltstone or sandstone. The predominate soil is Orford silty clay loam, 30 to 70 percent slope. This soil has characteristics of rapid run-off, moderately slow permeability in the sub-soil with a high available moisture holding capacity. The erosion hazard on these steep soils is severe and the capability unit is VIIe-1. The hydrologic soil group classification of soils in Hunter Creek is estimated to be:

30% = Hydrologic Soil Group B
50% = Hydrologic Soil Group C
20% = Hydrologic Soil Group D

Small amounts of A soil group are found in the downstream reaches.

The climate of the Hunter Creek watershed is under a marine influence. The watershed is located on the west side of the coast range. The ocean and mountains greatly influence the climate. Normal annual precipitation for Hunter Creek watershed is approximately 85 inches with normal run-off equal to 60 inches. Eighty percent of the annual rainfall normally occurs during the October through May period. Snow occurs at the higher elevations but is normally of little importance within the Hunter Creek drainage.

Most of the watershed area is in forest cover. Logging operations are scattered throughout the watershed. Residential areas are generally confined to the lower reaches of the river near the floodplain.

FLOODPLAIN STUDY AREA

Hunter Creek Flood Hazard Study covers in detail 6.8 miles of Hunter Creek. The Creek in this area flows in a sinuous pattern from the south-east to northwest. Upstream portions are characterized by narrow valleys, steep side slopes and the lower portion widens out to a wider, flat floodplain area. The stream channel is 100-200 feet wide in most places. Floodplain width ranges up to approximately 700 feet wide. Some areas have no floodplain. Tides influence the stream levels for approximately 1.25 miles upstream from the mouth of Hunter Creek.

There are seven bridges crossing Hunter Creek within the study area. The lower bridge carries U. S. Route 101. It is above flood level and does not affect flooding. Three of the bridges are access roads to private homes across the creek. Hunter Creek Road crosses the creek in three places. These bridges have a variable, but measurable effect upon the flood elevations. Land uses within the study area include residential, a small amount of commercial and agricultural. Some areas are in forest and brush. Also within the study area is the county maintenance yard.

The upland soils bordering the study area are Orford silty clay loam, and Sebastian very stony loam. Orford silty clay loam is predominant and use limitations on this soil are severe for sanitary facilities, construction material, building sites, water management and recreational developments. The limitations are due primarily to steep slopes but also to excessive fines and low strength. It has a good suitability for woodland wildlife habitat. The Sebastian series is a shallow, well-drained very cobbly soil formed on serpentine. The use limitations on this soil are also severe for sanitary facilities, construction materials, building sites, water management and recreation. The limitations are due to severe slope and large stones. These soils are generally not suitable for wildlife habitat. The river valley soils are a mixture of Gardner fine sandy loam, Knappa clay loam and silty clay loams, Chetco silt loam and river wash soils. These soils also have severe limitations, particularly due to flooding in the lower areas.

NATURAL AND BENEFICIAL FLOODPLAIN VALUES

Although there have been some changes in land use and vegetation, many of the natural floodplain uses and values exist as they were in earlier times. Natural forest vegetation includes willow and red alder, Oregon myrtle, maple, and some Sitka spruce and Douglas-fir. Other natural vegetation includes shrubs, grasses and weeds. Many plants exist on the sand and gravel river-wash such as carex, willow and juncus. Anadromous and resident fish are salmon, steelhead, trout and a few saltwater species in the estuary. Land animals are black-tailed deer, Roosevelt elk, rabbit, raccoon, otter, ring-tailed cat, mink, eagle, osprey, and numerous other small birds and mammals, as well as man. There are no rare, threatened, or endangered plants or animals in the floodplain.

There are no known cultural resources in the Hunter Creek floodplain.

Some small fields on the terraces are used for pasture. A few clusters of houses are scattered along the floodplain. There is little harvesting of timber from the floodplain area because there is little available commercial timber. Streambank erosion is controlled primarily with vegetative measures. There are gravel removal sites in the stream with gravel be-

ing used for private and county road maintenance.

Some flooding is common on an annual basis. The floodplain easily handles the annual storms; larger storms spill over onto the first terrace level and are moderated through spreading of the water.

Except for some streambank erosion and temporary inputs of wastes from man's activities, the floodplain soils and gravelly river bottom filter pollutants and maintain high water quality. The river water is usually clean and clear.

During high flood stages, water readily enters aquifers both vertically and laterally through the floodplain soils. It leaves as readily during low flows. Much of the floodplain indicated in this report would be classified as seasonally flooded wetlands. The lower mile of the river is a tidal estuary with some accompanying tidal marsh. No other wetland types have been located in the study area.

Water is available for plants and animals throughout the year, thereby providing habitats for the previously-mentioned species. Major forms of recreation on and adjacent to Hunter Creek are fishing, camping, animal viewing, hunting, sightseeing, swimming, and rock collecting.

Although there have been some modification of land use, changes in vegetation, and additions of roads, bridges, houses, and fences, there have been few real values lost. Restoration opportunities are minimal.

FLOOD HISTORY

The rainy season for the Oregon Coast is between October and March. Eighty percent of the annual precipitation occurs during this period. Precipitation is heaviest in the months of December and January. During this rainy season, the ground is often saturated so that runoff is greater than that associated with the storms when the ground is dry. High tide affects the inundated area in the lower one mile of Hunter Creek.

Hunter Creek overflows portions of its banks on an almost annual occurrence. The damage associated with these annual floods is not great and the duration of flooding on the creek is less than 24 hours. The runoff rate for the watershed is relatively fast, so peak discharges can occur suddenly following high rains.

The largest flood of recent record on Hunter Creek occurred in December 1964. At this time, heavy precipitation occurred daily from the 19th to the 26th, maximum precipitation rate occurred on the 22nd. A total rainfall of 11.8 inches was reported for the storm at Gold Beach. Inland rainfall amounts were significantly higher. Several areas were flooded to extreme depths by this flood. Reports of damage on Hunter Creek due to the flood are sparse since much more extensive damage was experienced on the Rogue and the Chetco Rivers, also in Curry County. Other notable floods have been reported in the area in December of 1861, February 1890, February 1927, December 1955, December 1965 and January 1971.

A large flood of 1% chance magnitude would cause significant flooding in several sections of Hunter Creek. The creek alternates between narrow confined valleys, and wider, more open valleys. These open areas are generally flooded by the 1% chance storm. A 1% chance flood is defined as a storm with a 1% probability of occurring in any year. The 1% chance flood is frequently referred to as a 100-year flood.

The narrow confined portions of the river can act as natural obstructions in the river. These natural obstructions tend to increase water levels and may collect debris within the reach. The bridges over the river channel are man-made obstructions which also can cause an increase in flood elevation. These studies indicate that the bridges at cross section H-18B and at H-32B cause a significant rise in flood elevation. Bridges also can be debris collectors and can cause additional water heights. The other bridges have a minimal effect on flood elevations. The effect of debris and debris dams upon maximum flood elevations has not been addressed by this study, however, it should be a consideration in determining locations and elevations of buildings.

The 100-year storm event has channel velocities between 4 and 20 feet per second. The median channel velocity is thirteen (13) feet per second, the median depth of flow for this storm is fifteen feet. The floodplain area inundated by the 1% chance flood is 213 acres. Table 1 shows the flood areas by reach. Approximately 31 residences and 10 commercial buildings would be flooded by the 100-year storm.

Extreme high tides would cause some flooding in the downstream portions of Hunter Creek. Normal high tide elevations would not increase flood elevations from the events mapped in this study.

Future flooding conditions are expected to be similar to the present. The upstream land use will continue to be essentially forest practices. Although logging is being carried out in extensive areas, the reseeded of

forest areas will quickly return it to a forested hydrologic condition. Peak discharges are not expected to change in the future. Further development and restrictions of the channel in the lower reaches of the watershed could have measurable effect on the elevation of floodwaters. Continued implementation of management controls on development will minimize future flood damages.

TABLE 1
FLOOD CHARACTERISTICS BY REACH

| Reach No. | Channel | Area Flooded (Acres) | | Average Difference In Elevation 1% to 10% (feet) |
|-----------|---------|----------------------|-------------|--|
| | | 1% Chance | 0.2% Chance | |
| 1 | 38 | 108 | 133 | 2.0 |
| 2 | 15 | 24 | 27 | 3.0 |
| 3 | 59 | 81 | 101 | 2.0 |
| Total | 112 | 213 | 261 | |

FLOODPLAIN MANAGEMENT

EXISTING PROGRAMS

Curry County has a floodplain ordinance which is designed to reduce damage caused by a 100 year-flood. The ordinance states that all new structures, including mobile homes, must meet the following conditions:

- All new water supply systems minimize the infiltration of flood waters.
- All new sanitary sewage systems are to minimize both the infiltration of floodwaters into the system and also the sewage from leaving the system and entering the floodwaters.
- All structures located in the 100-year floodplain are to be anchored in such a way as to resist flotation, collapse, and lateral movement.
- All new residential structures, including mobile homes, are to have the lowest floor elevation, including the basement, at or above the 100-year flood elevation.
- All new non-residential structures shall have the lowest floor, including the basement, at or above the 100-year flood elevation, or a combination of the following:
 - The structure must be floodproofed with the part below the 100-year flood elevation being watertight.
 - The structural components shall be capable of resisting the hydrostatic loads, hydrodynamic loads, and buoyancy.

Curry County is presently in the regular flood insurance program as administered by the Federal Emergency Management Agency. In those communities participating in the FEMA program, owners and occupiers of all buildings and mobile homes in the entire community are eligible to obtain flood insurance coverage. It is recommended that buildings and mobile homes within or adjacent to the delineated flood hazard areas carry flood insurance on the structure and contents.

There is no specific National Weather Service (NWS) flood warning and forecasting system available for Hunter Creek. When the NWS determines that a large storm or rapidly melting snow may create flooding conditions along the southern Oregon coast, flood bulletins are issued to the local radio stations.

Throughout the development of this study, public participation and information has been solicited. Information on previous flooding, including high water marks were obtained from local residents and county officials. The public, including local residents on Hunter Creek, were given the opportunity to review the preliminary maps showing the floodplain and the floodway at a publicly announced workshop.

FLOODWAY

Encroachment on floodplains, by structures and/or filling, reduces the flood-carrying capacity and increases flood heights, thus increasing flood hazards in areas upstream and downstream from the encroachment itself. One realistic aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard and potential damage.

The concept of a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area inundated by the 100-year flood is divided into "floodway" and "floodway fringe areas." The floodway is the channel of a stream plus adjacent floodplain areas that must be kept free of encroachment in order that the 100-year flood be carried within a certain specified maximum increase in flood height. Regulations enacted by the Federal Emergency Management Agency, HUD, limit such increases in flood heights to a maximum of one foot. In this report, floodways are proposed to the local governments as minimum standards that can be adopted or that can be used as a basis for additional studies and refinement.

The area between the designated floodway and the boundary of the 100-year flood is called the "floodway fringe." No encroachment into the floodway should be allowed; however, building in the floodway fringe could be permitted if floor levels are above the 100-year flood elevation. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown on Figure 1.

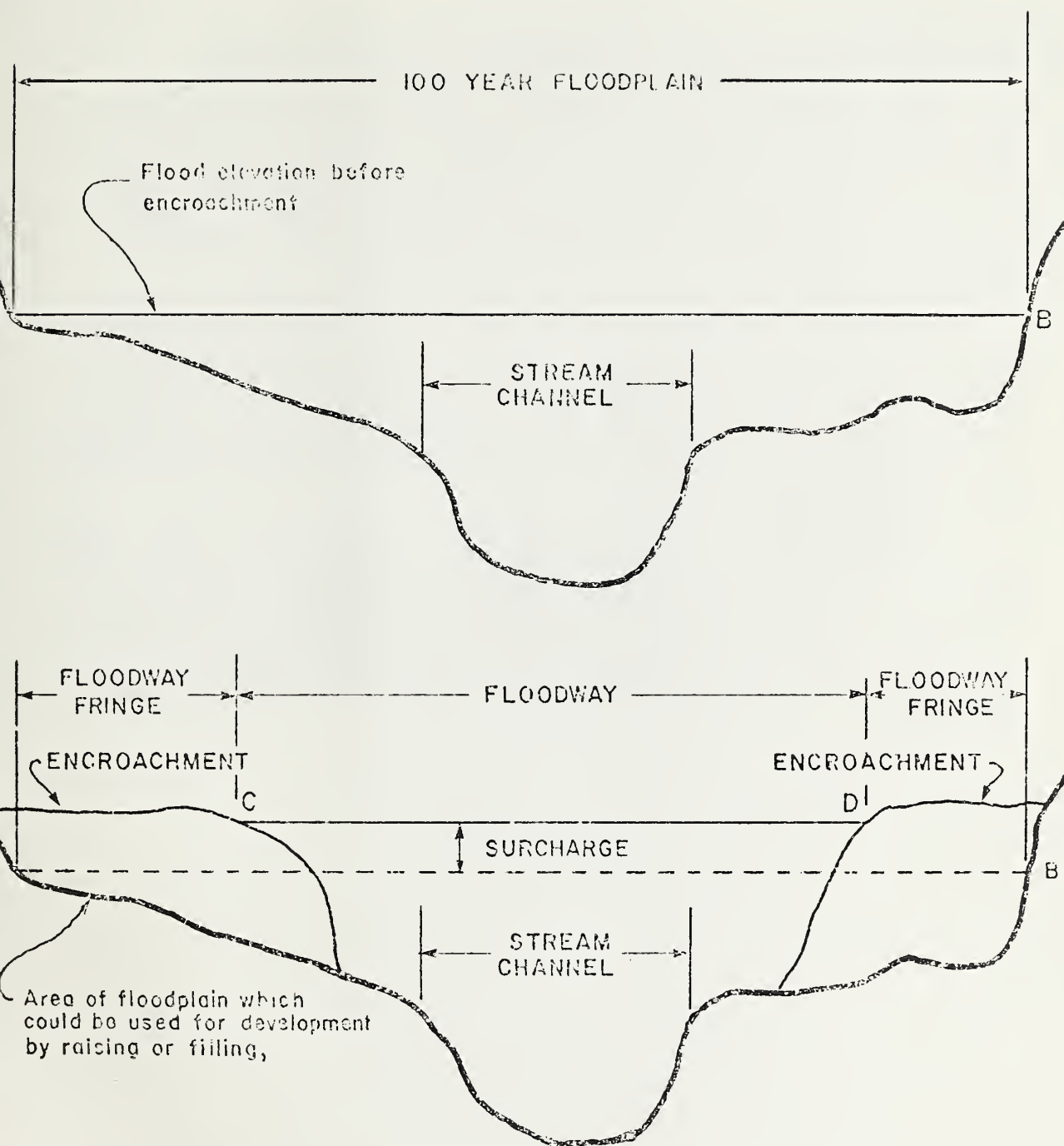
Diking is considered an encroachment on the floodplain the same as filling. Diking should only occur in the floodway fringe area.

FLOOD HAZARD EXHIBITS

The Hunter Creek Watershed Map in the front of this report, outlines the drainage area of the Creek. It also shows the extent of the study area. A Location Map is also included on this sheet.

The Index Map, Appendix A, shows the study area and the 100-year floodplain. The location of each of the 9 Flood Hazard Maps, which contain the plan and profiles of various floods, is outlined on the Index Map.

Appendix B contains the Flood Hazard Maps. The photomaps (plan view) located at the top of each sheet, show the area inundated by the 100-year and 500-year floods. In the places where only the 100-year floodplain is indicated, the line represents both the 100-year and 500-year floodplains. This is because the two floodplains are so close together that only one line could be shown on the drawings. The floodway is also shown on the photomaps. The location of each cross section and the 100-year flood elevation at the section is also on the photomaps. The flood elevations have been computed at each cross section and the elevation between cross section has been interpolated. After computing the flood elevations, the outline of the floodplain was developed in the field. It is possible that small local islands exist within the floodplain and are not shown on the photomaps. Some slight flooding may occur outside the designated floodplain due to concentrated local runoff from adjacent areas. To determine



LINE A-B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT

LINE C-D IS THE FLOOD ELEVATION AFTER ENCROACHMENT

FIGURE 1

the flooding potential at a specific location, a field survey would be required using the computed or interpolated flood elevations.

Reach designations are shown on the Index Map and Flood Hazard Maps. Each reach has similar flooding characteristics with the difference between the 100-year and 10-year flood elevations being relatively consistent. Within any reach, the difference in elevation does not vary more than 1.0 foot for more than 20 percent of the reach. These reaches and elevation differences are tabulated in Table 1. Several bench marks are located on the photomaps and tabulated in Appendix E. River mile distance is noted at the centerline of the river on the Appendix B maps.

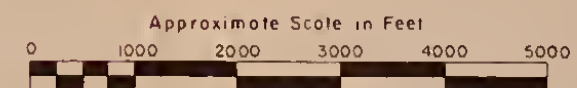
The profiles are located in the lower part of the Flood Hazard Maps (Appendix B). The profile shows the river bottom, and the 10-, 50-, 100-, and 500-year flood elevations. Reach designations are shown along with the cross section locations and their stationing. The river mile index is also shown on the profiles. The profile will give an indication of the depth of flooding at the deepest point on each surveyed cross section and the slope of the flow lines. The bridges in the study area are located on the profiles.

Typical valley cross sections are shown in Appendix C. These cross sections are representative of the sections which are in the study. The 10-, 50-, 100-, and 500-year flood elevations are drawn on these cross sections to indicate depth and types of flooding on Hunter Creek.

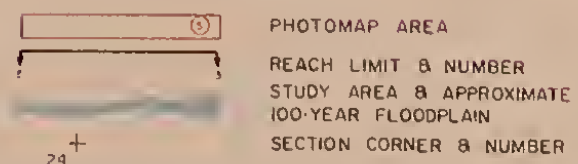
Other Appendices include the following; Appendix D - Tabulation of discharge frequency data and water surface elevations, Appendix E - Investigations and Analyses, Appendix F - Glossary of Terms, Appendix G - Bibliography.

INDEX MAP
HUNTER CREEK
CURRY COUNTY, OREGON
NOVEMBER, 1980

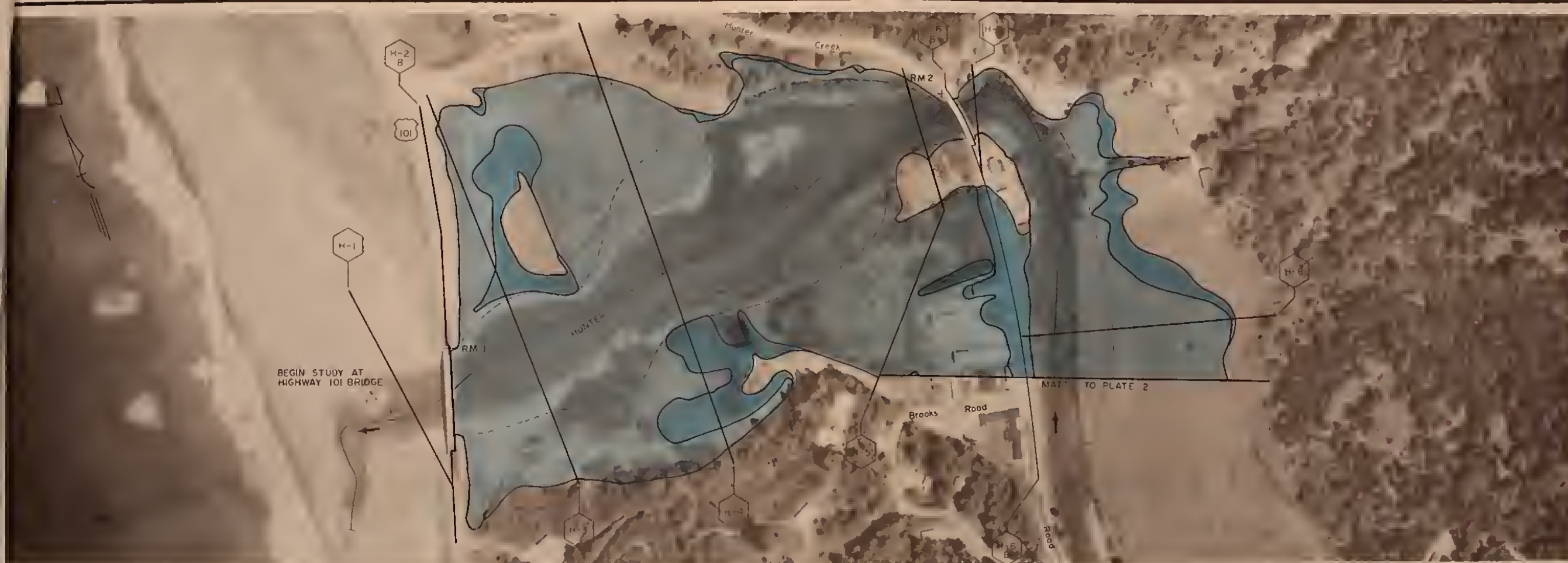
APPENDIX A



LEGEND



SOURCE: Photomap base is from Curry County flight of Sept., 1976.
Thematic detail prepared by the Oregon state staff.



LEGEND

PLAN



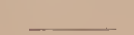
Proposed Floodway
100-Year Flood Boundary
500-Year Flood Boundary



Reach Break

+ RM 3

Benchmark



Siskiyou National Forest Boundary

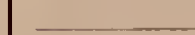


Center of Streamflow With River Mile

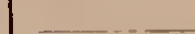


Cross Section With 100 Year Flood Elevation

PROFILE



500-Year Flood Profile



100-Year Flood Profile



50-Year Flood Profile



10-Year Flood Profile



Road Surface



Bridge Girder

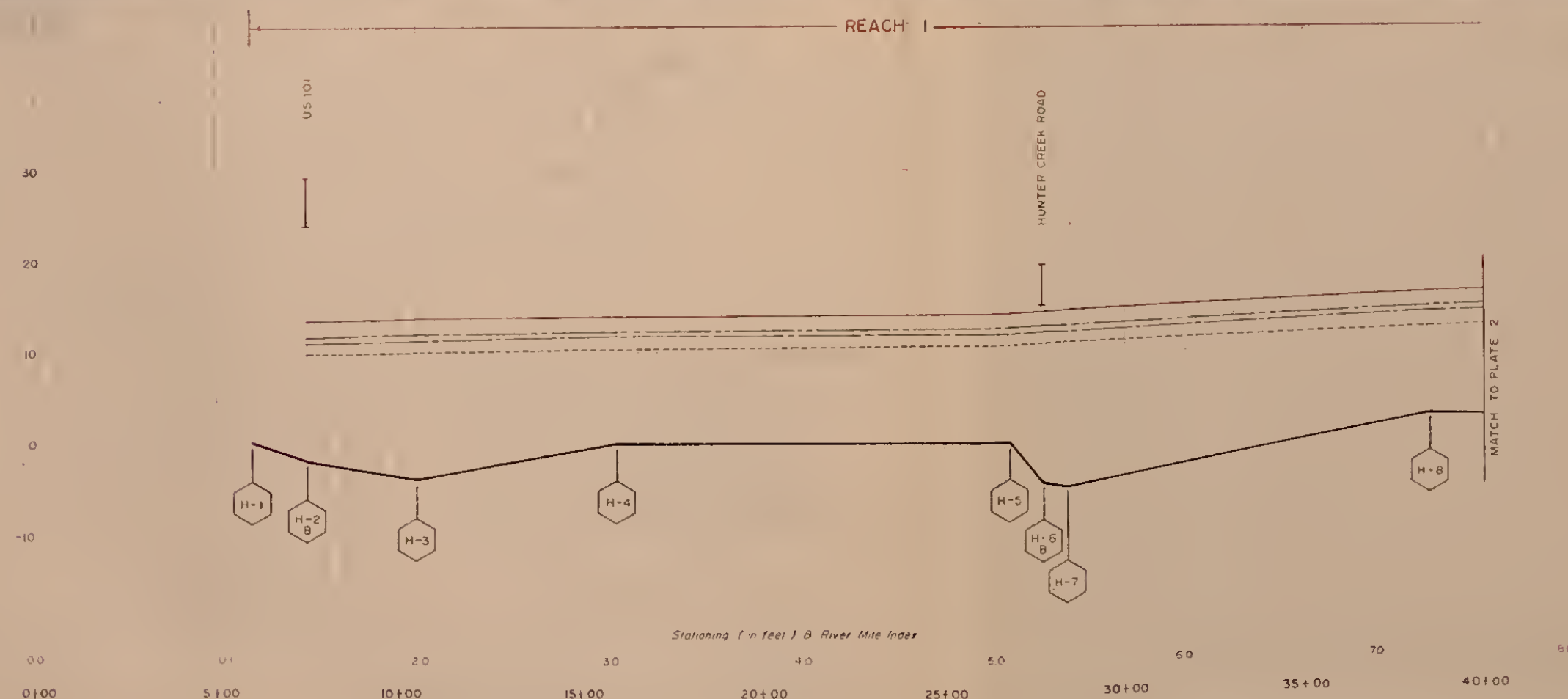


Stream Bottom



Cross Section

Elevation in feet (mean sea level)



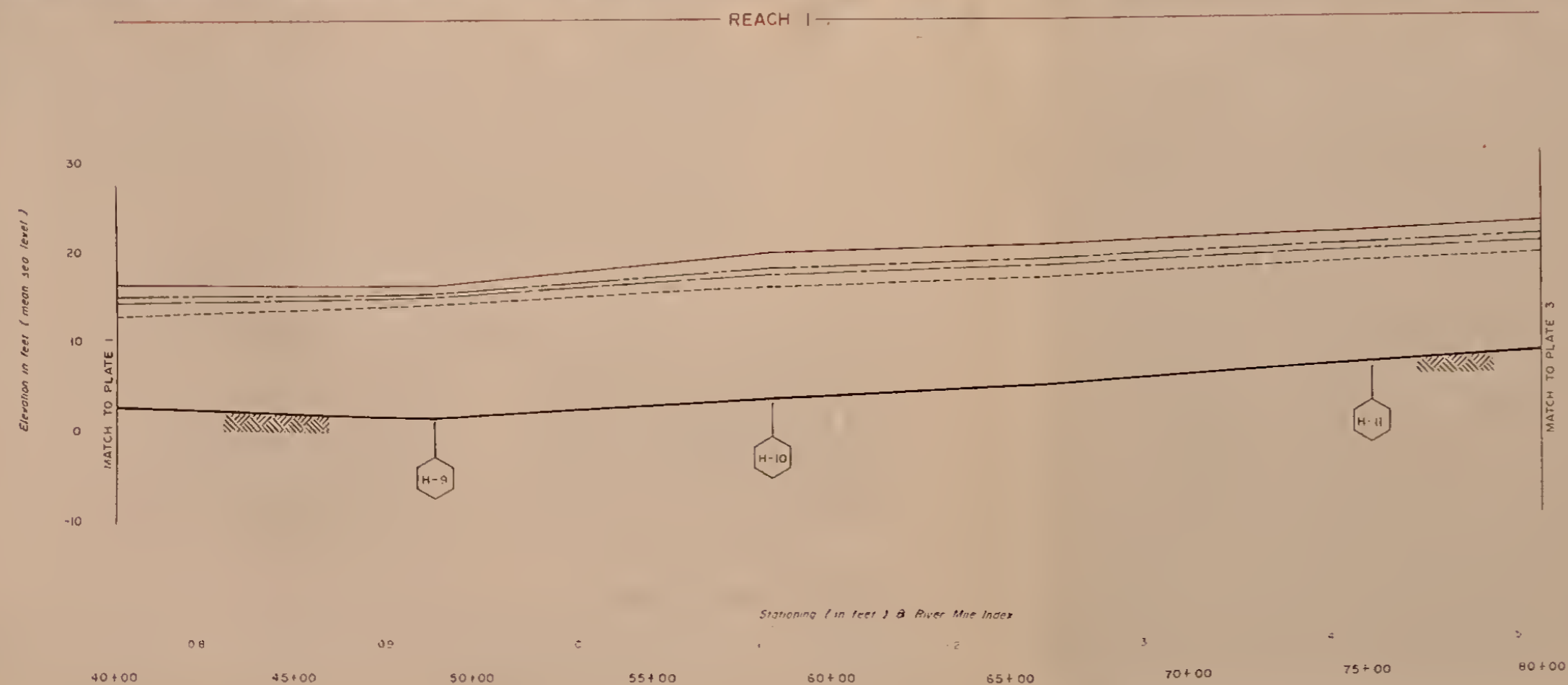
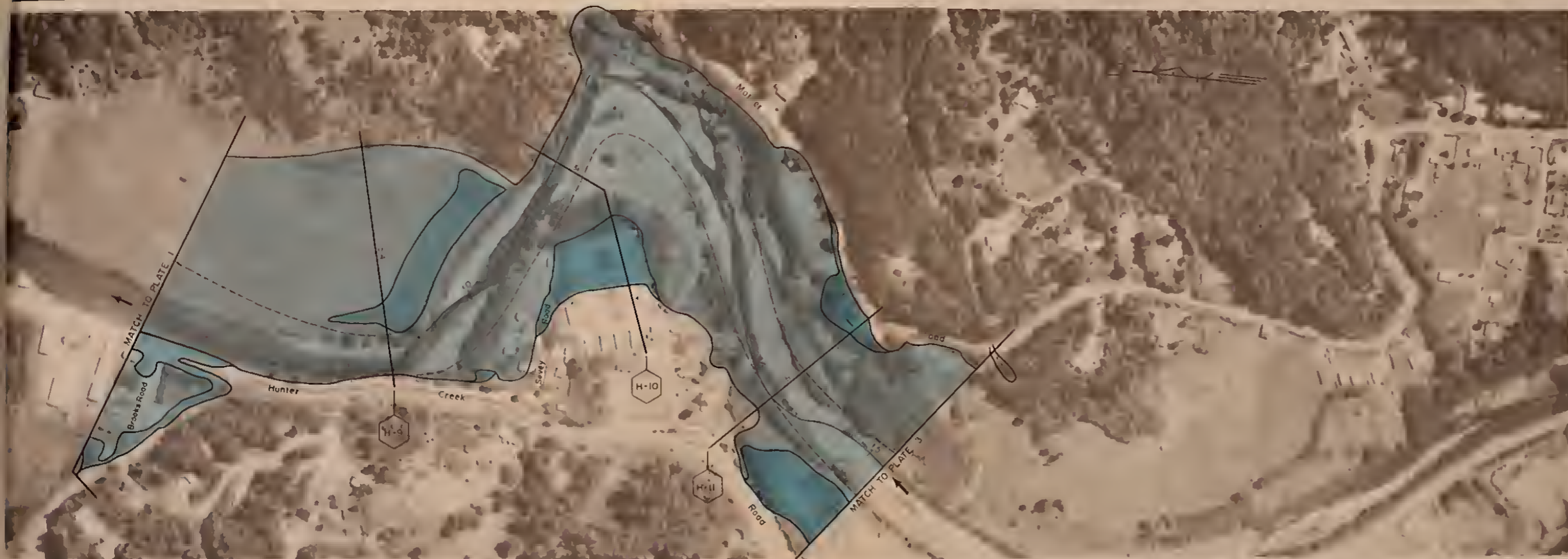
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FLOOD HAZARD MAP HUNTER CREEK CURRY COUNTY, OREGON



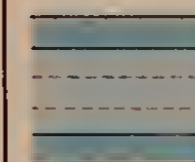
Photomap base is from Curry County and Siskiyou National Forest 1976 flights
Thematic detail by the Oregon State Staff

APPENDIX B
PLATE 1 OF 9



LEGEND

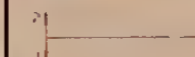
PLAN



Proposed
Floodway

100-Year
Flood
Boundary

500-Year
Flood
Boundary



Reach Break

+ RM 3

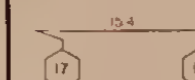
Benchmark



Siskiyou National Forest Boundary



Center of Streamflow With River Mile



Cross Section With 100 Year Flood Elevation

PROFILE



500-Year Flood Profile



100-Year Flood Profile



50-Year Flood Profile



10-Year Flood Profile



Road Surface



Bridge Girder



Stream Bottom



Cross Section

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SOIL CONSERVATION SERVICE

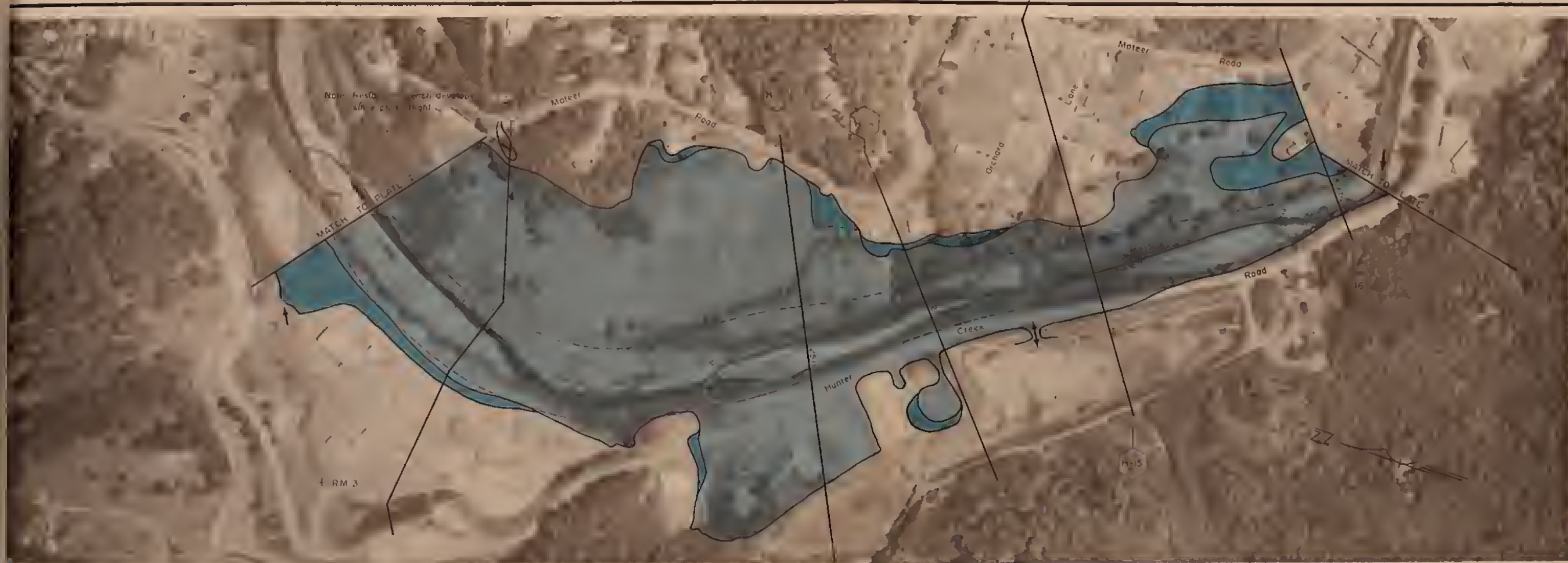
FLOOD HAZARD MAP HUNTER CREEK CURRY COUNTY, OREGON



Photomaps base is from Curry County and Siskiyou
National Forest 1976 flights
Thematic detail by the Oregon State Staff

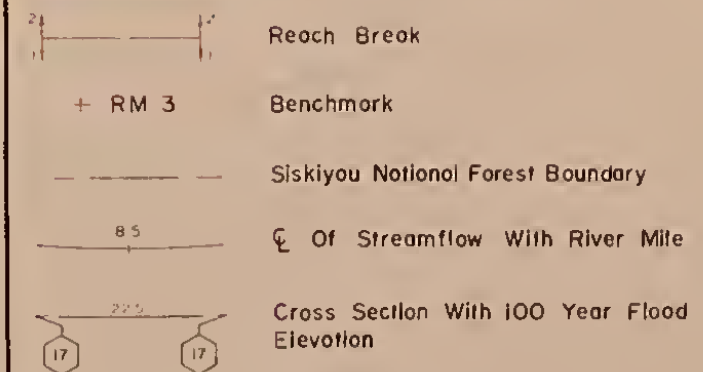
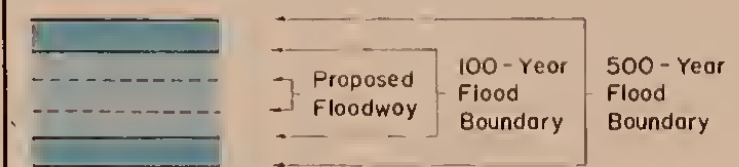
APPENDIX B
PLATE 2 OF 9



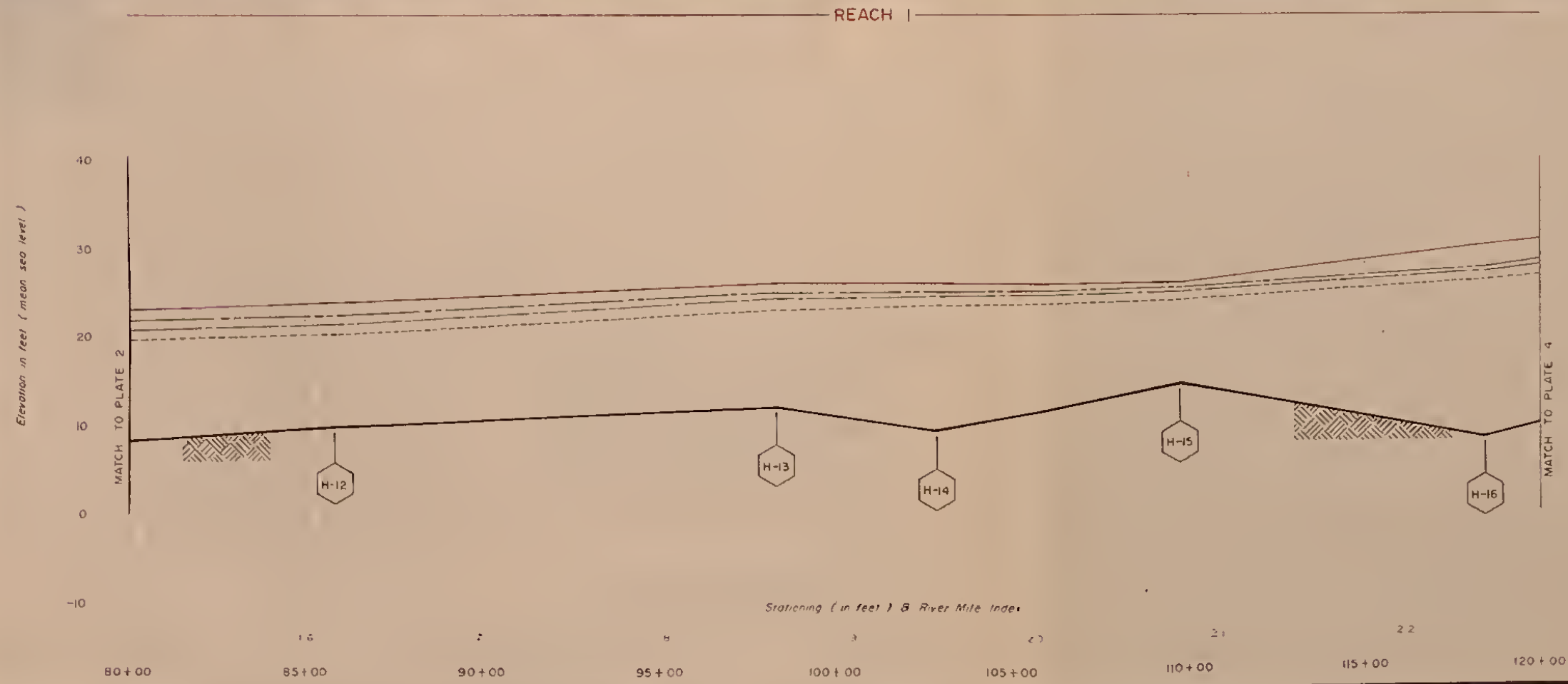
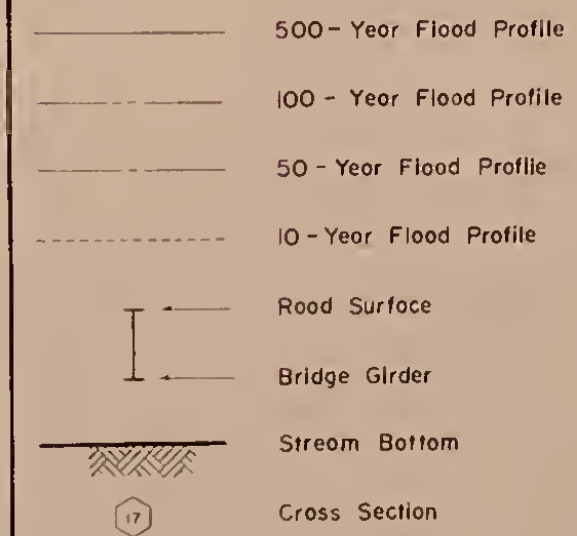


LEGEND

PLAN



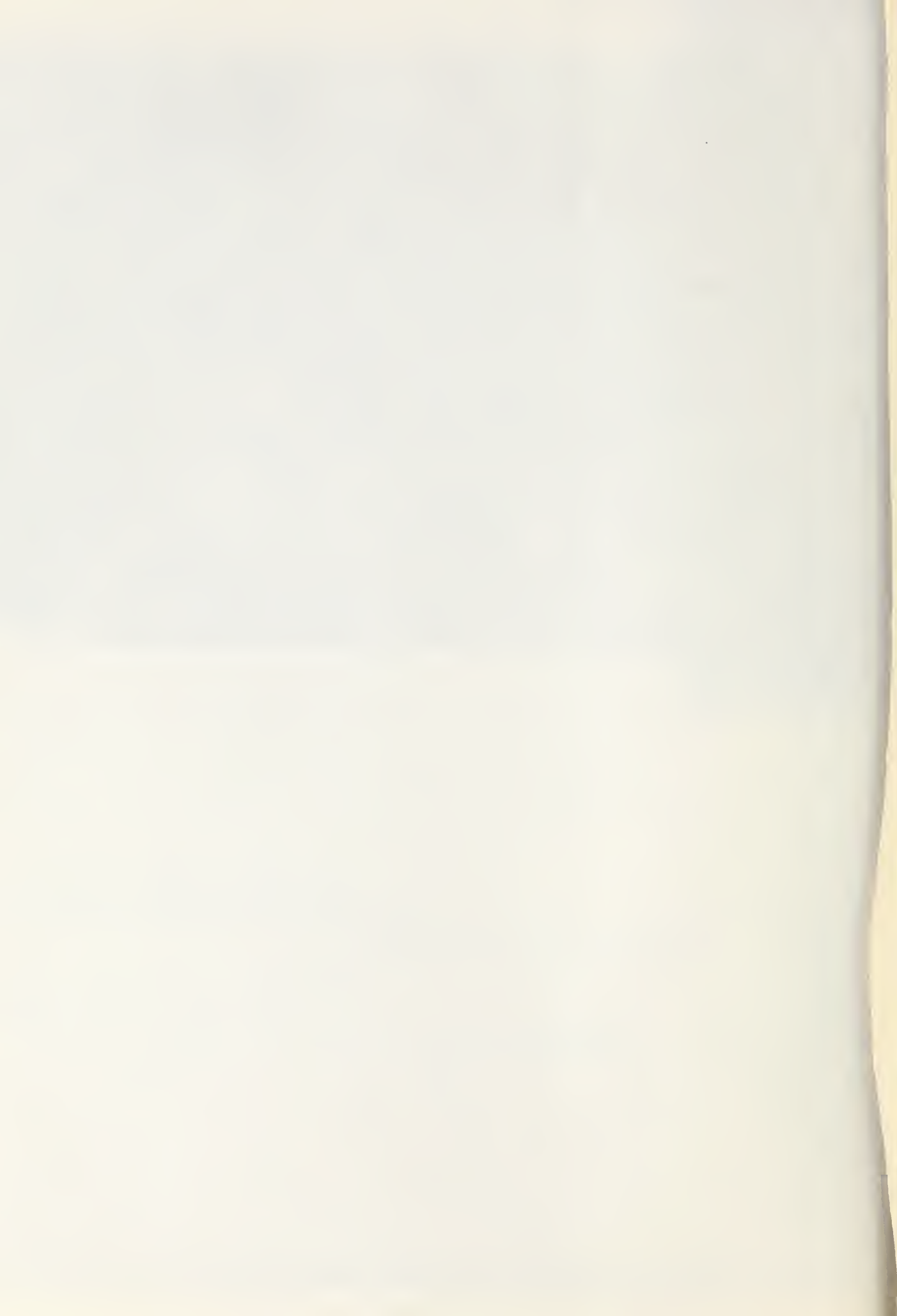
PROFILE

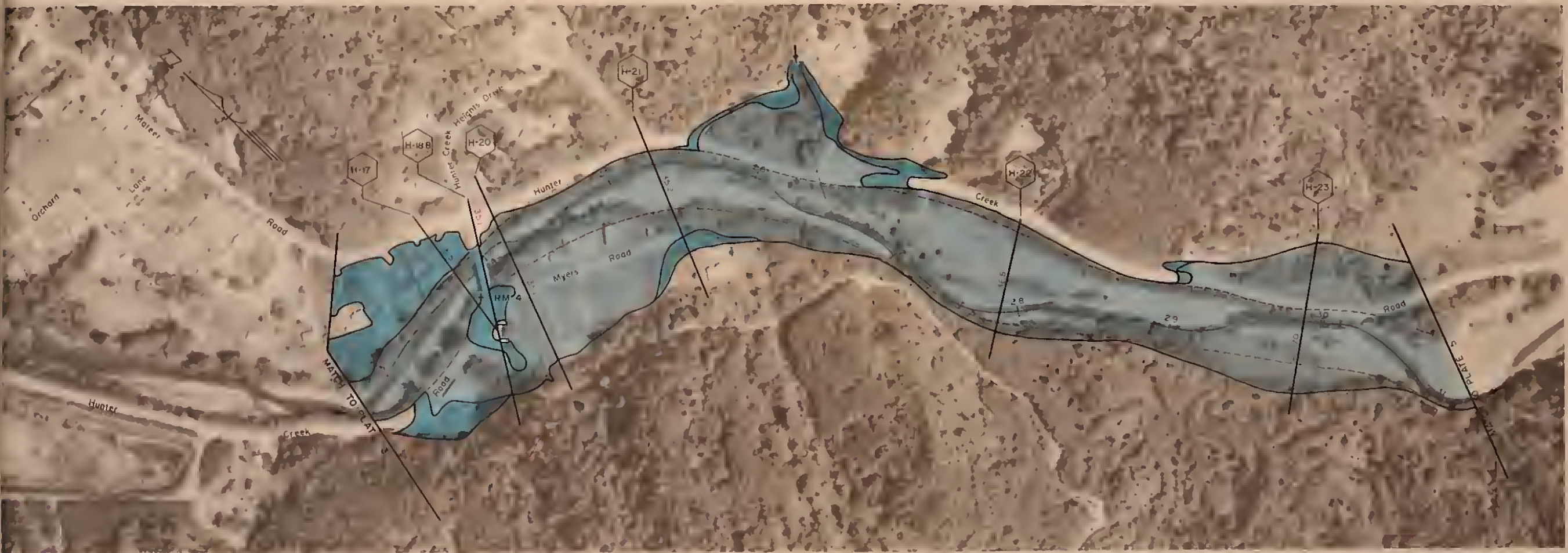


U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD MAP
HUNTER CREEK
CURRY COUNTY, OREGON



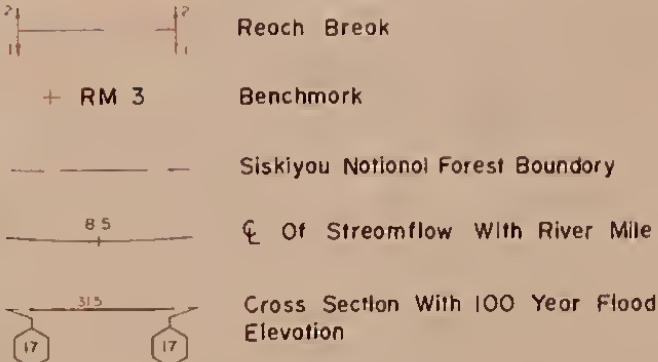
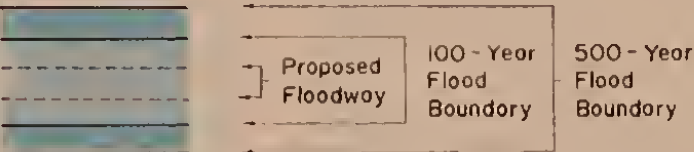
Photomaps base is from Curry County and Siskiyou National Forest 1976 flights
Thematic detail by the Oregon State Staff



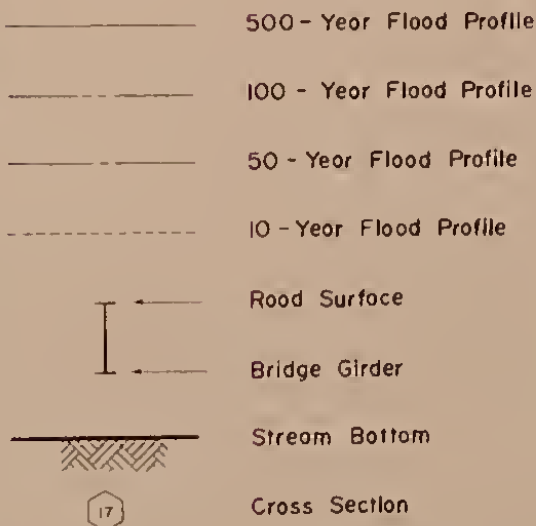


LEGEND

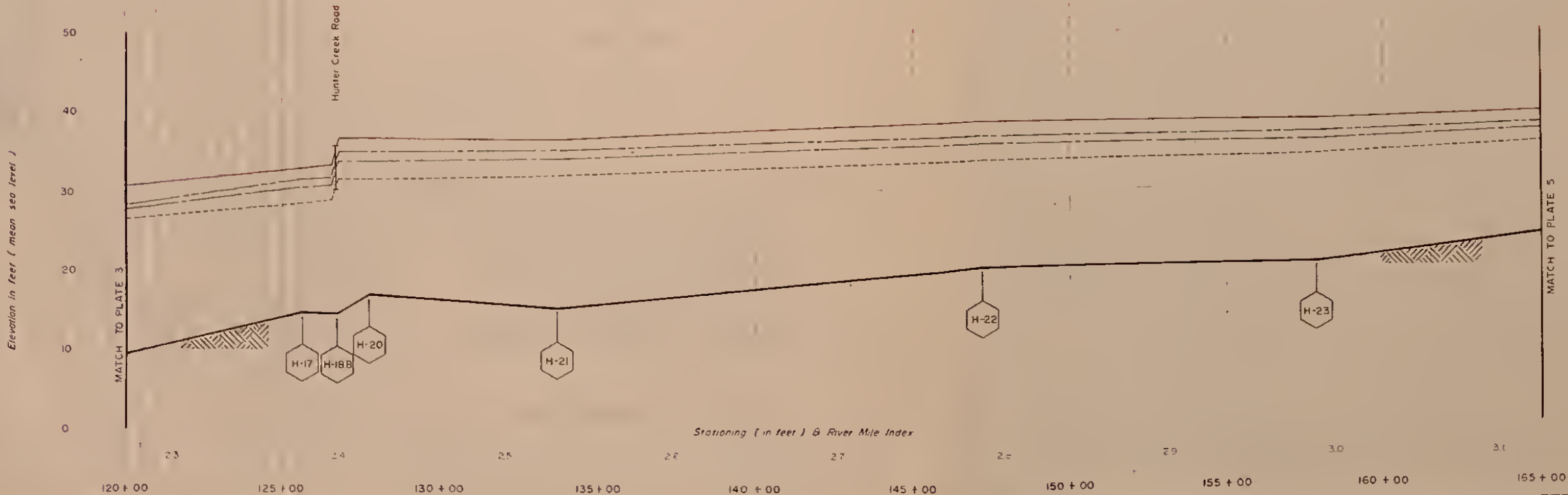
PLAN



PROFILE



REACH 1 REACH 2 REACH 3

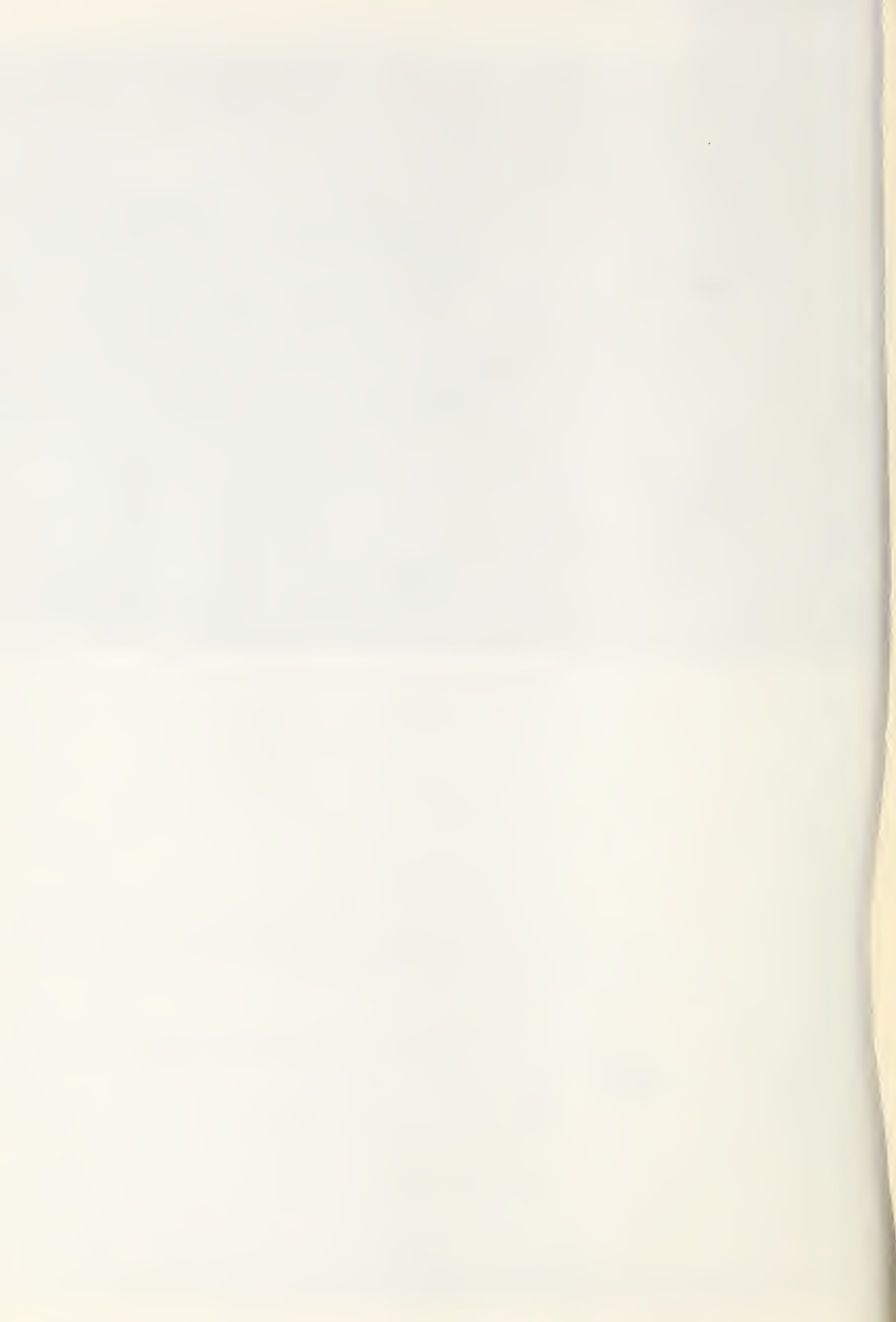


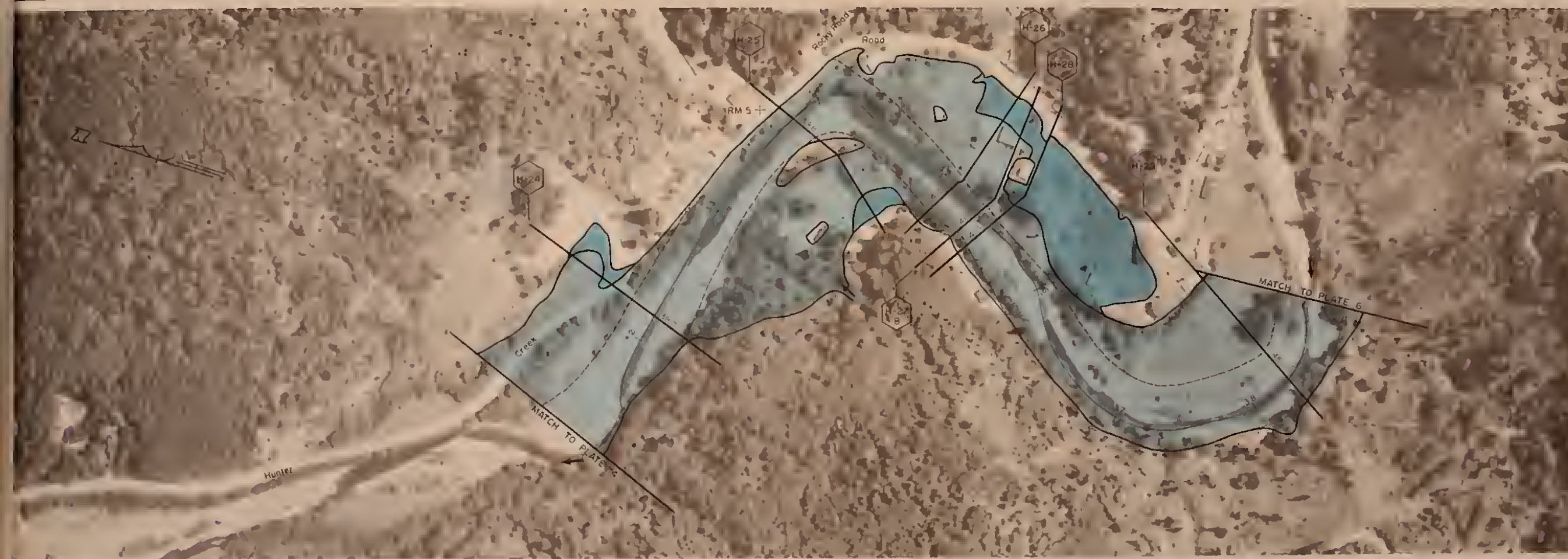
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD MAP
HUNTER CREEK
CURRY COUNTY, OREGON



Photomaps base is from Curry County and Siskiyou National Forest 1976 flights
Thematic detail by the Oregon State Staff

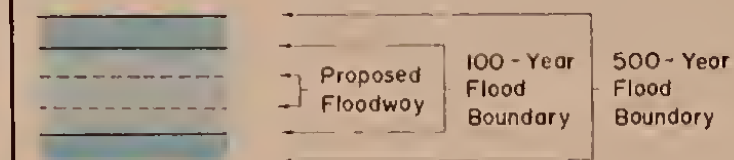
APPENDIX B
PLATE 4 OF 9





LEGEND

PLAN



Reach Break

+ RM 3

Benchmark



Siskiyou National Forest Boundary



Q of Streamflow With River Mile



Cross Section With 100 Year Flood Elevation

PROFILE



500 - Year Flood Profile



100 - Year Flood Profile



50 - Year Flood Profile



10 - Year Flood Profile



Road Surface



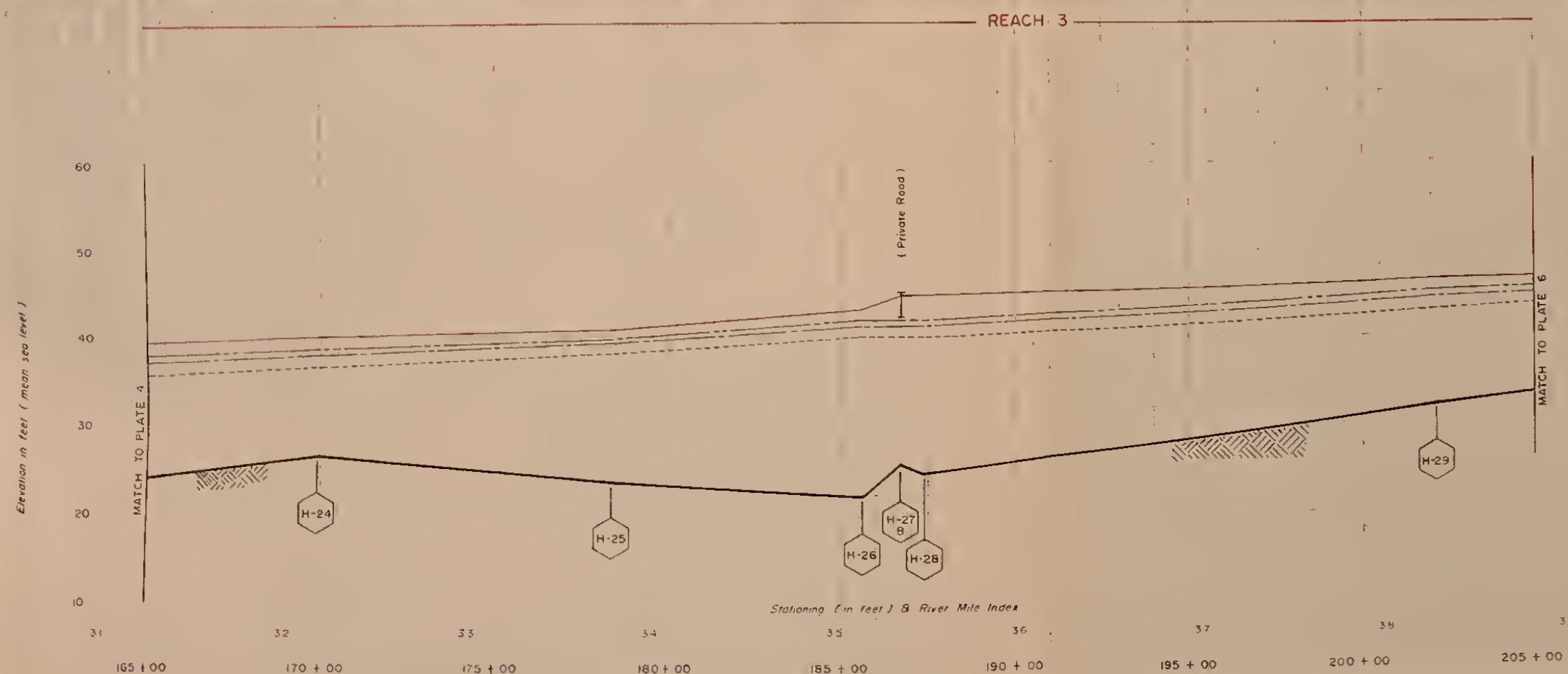
Bridge Girder



Stream Bottom



Cross Section



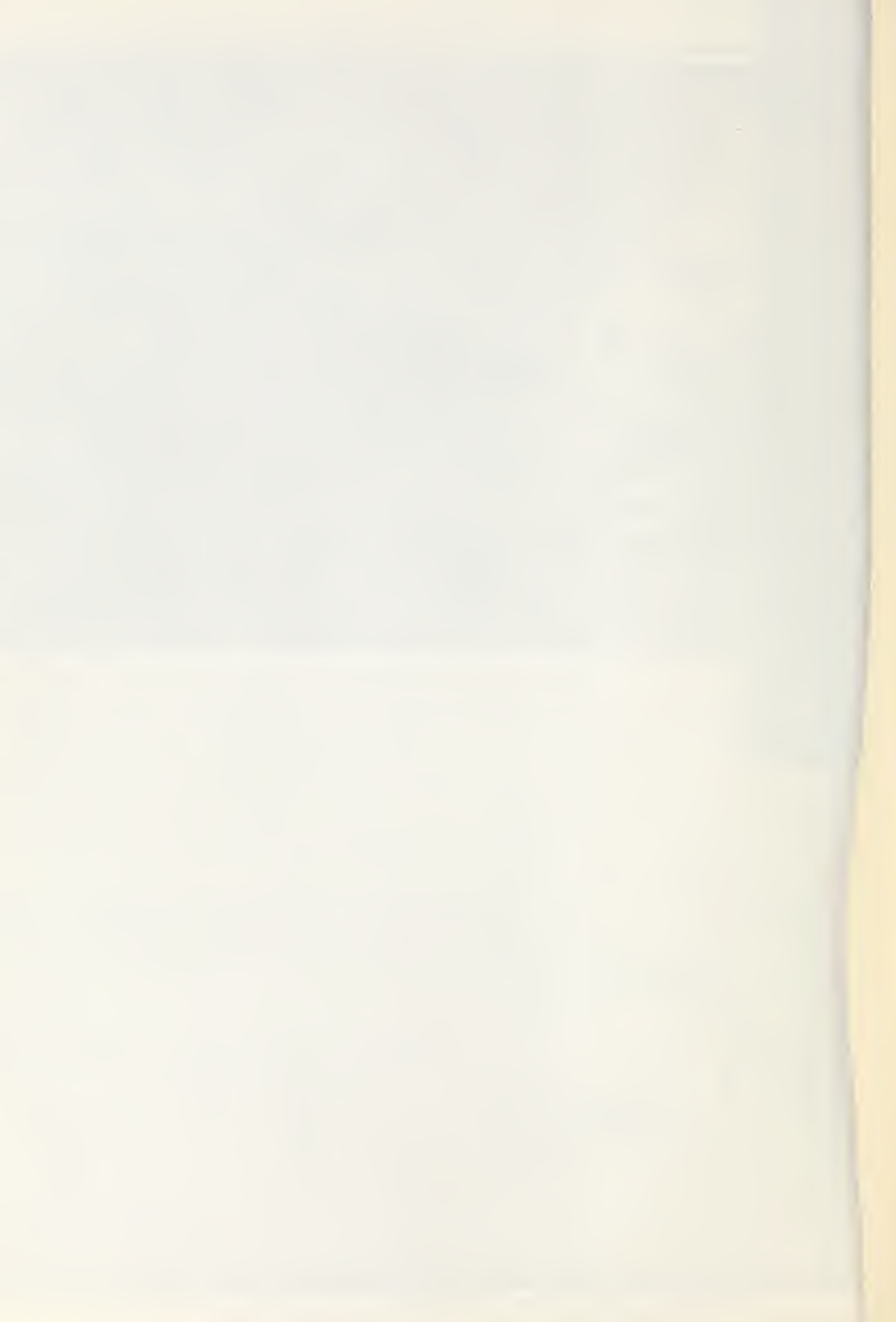
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SOIL CONSERVATION SERVICE

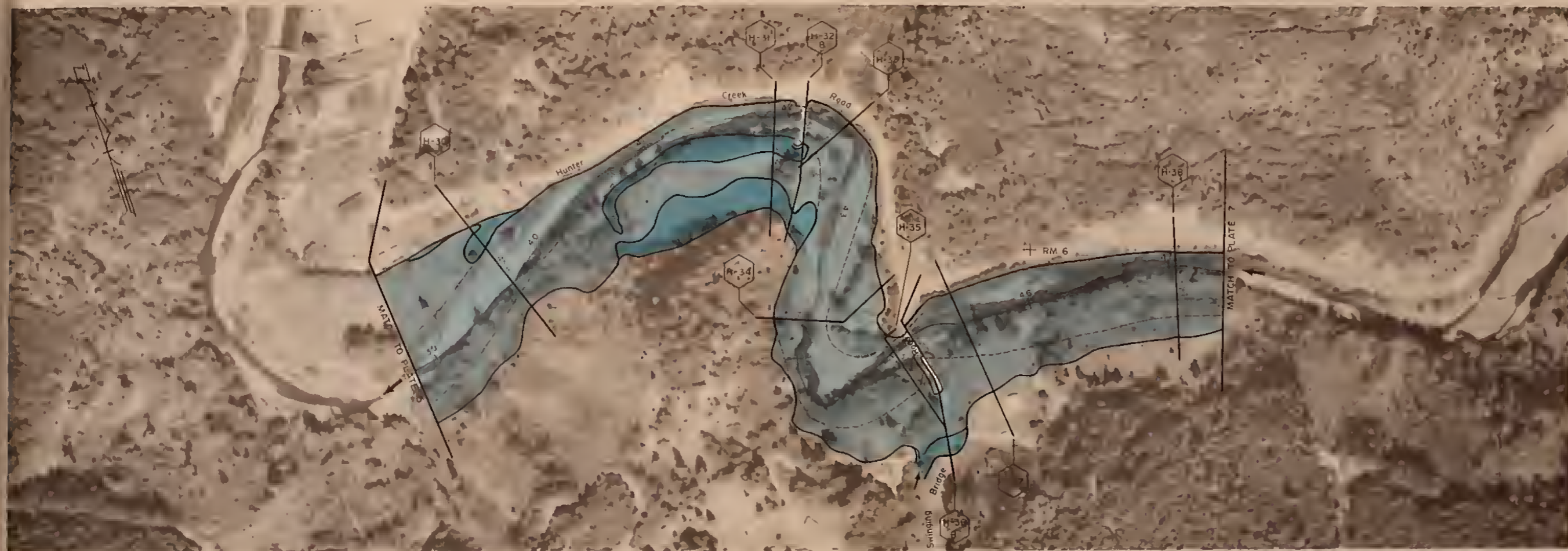
FLOOD HAZARD MAP HUNTER CREEK CURRY COUNTY, OREGON



Photomap base is from Curry County and Siskiyou National Forest 1976 flights.
Thematic detail by the Oregon State Staff

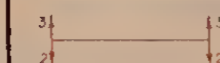
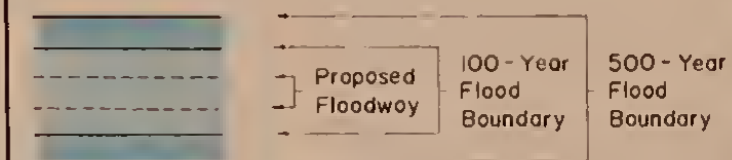
APPENDIX B
PLATE 5 OF 9





LEGEND

PLAN



Reach Break

+ RM 3

Benchmark

Siskiyou National Forest Boundary

Q of Streamflow With River Mile

Cross Section With 100 Year Flood Elevation

PROFILE

500-Year Flood Profile

100-Year Flood Profile

50-Year Flood Profile

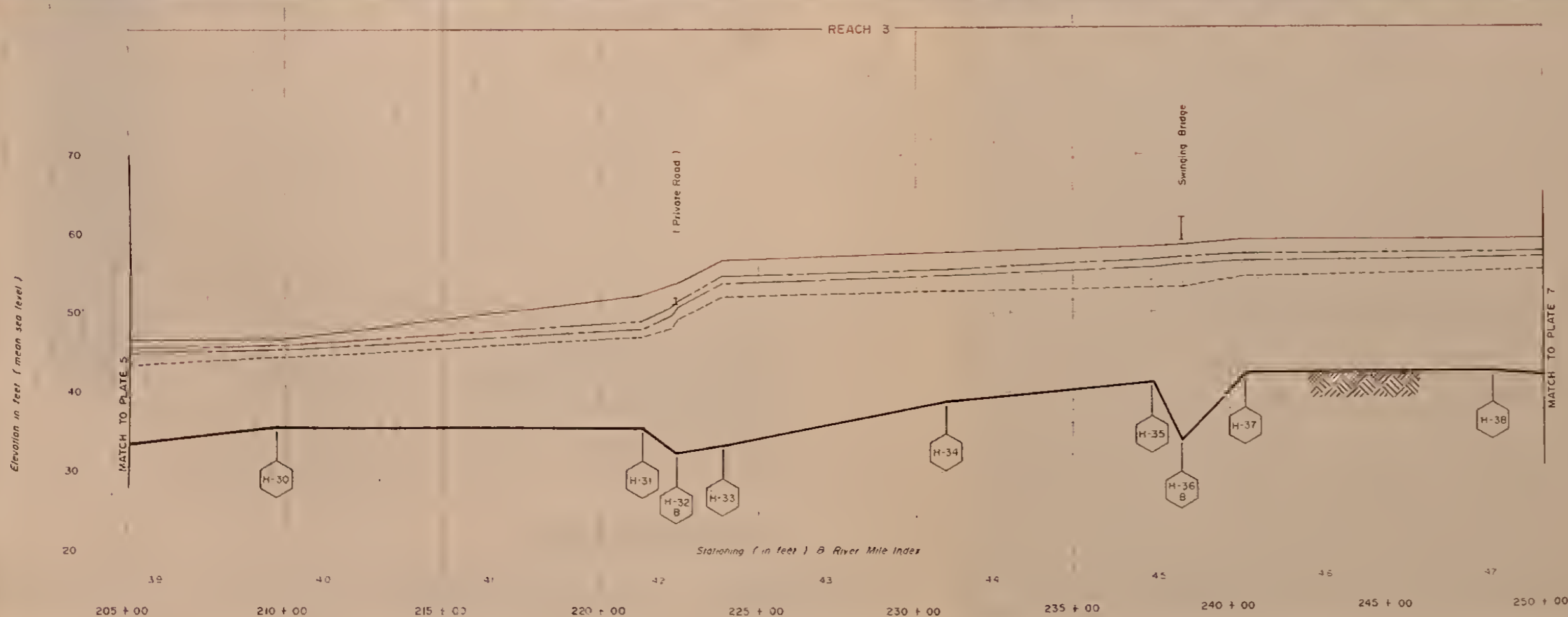
10-Year Flood Profile

Road Surface

Bridge Girder

Stream Bottom

Cross Section



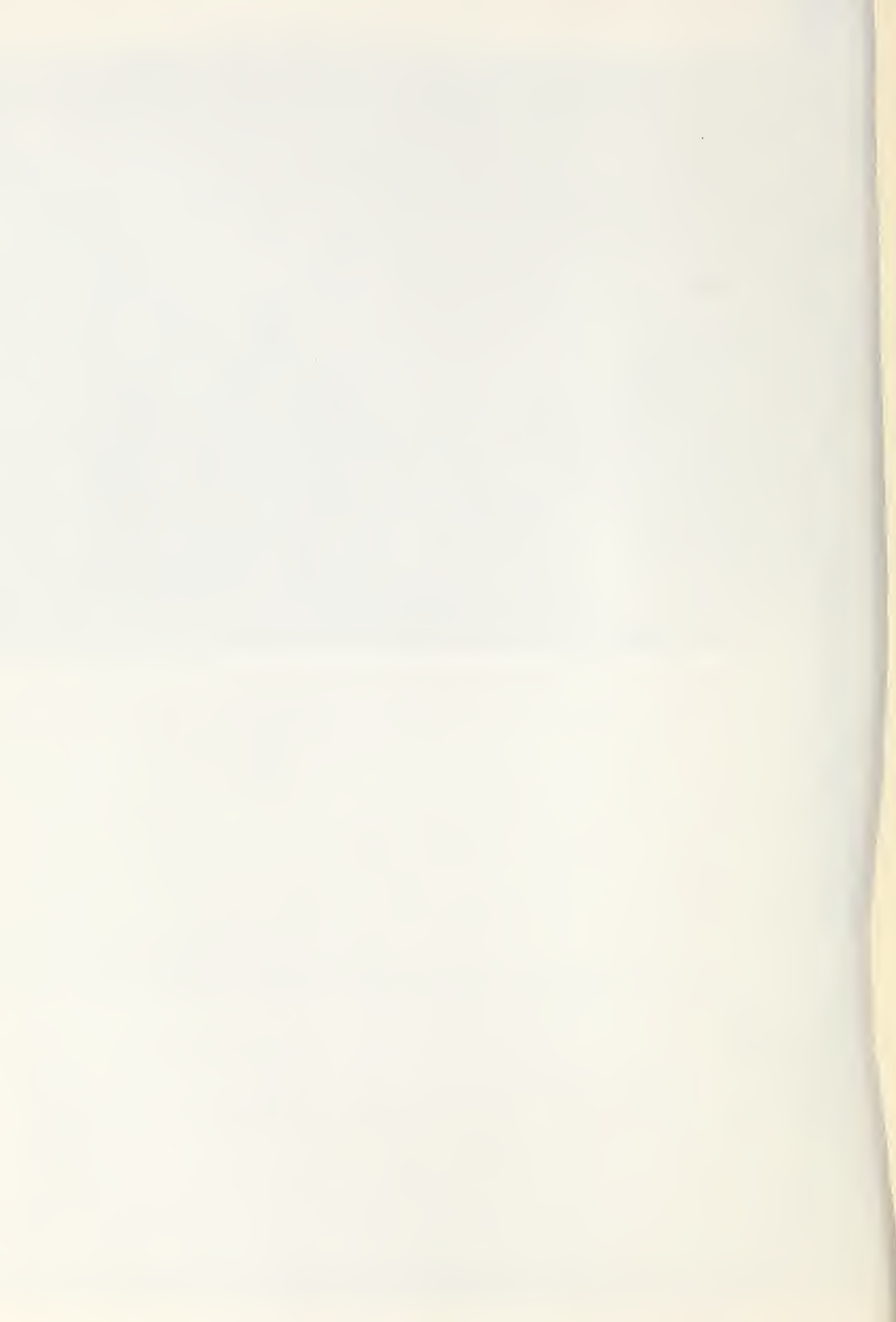
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SOIL CONSERVATION SERVICE

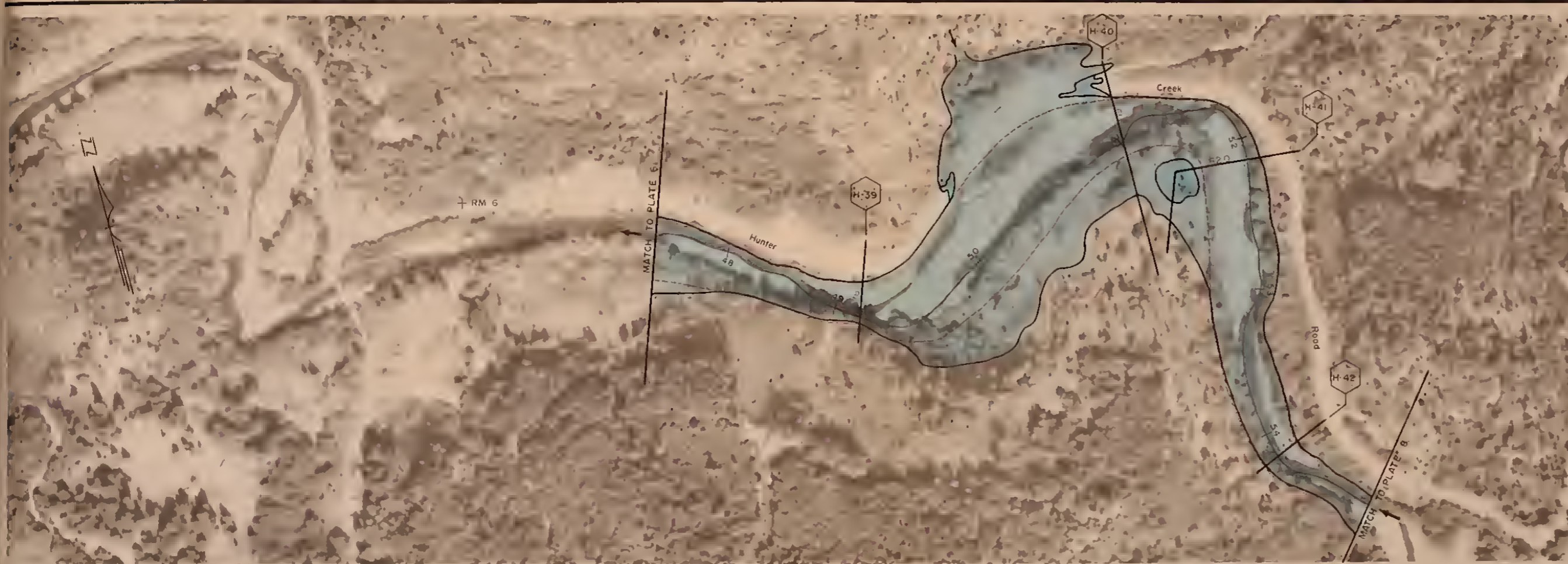
FLOOD HAZARD MAP HUNTER CREEK CURRY COUNTY, OREGON



Photomaps base is from Curry County and Siskiyou National Forest 1976 flights.
Thematic detail by the Oregon State Staff

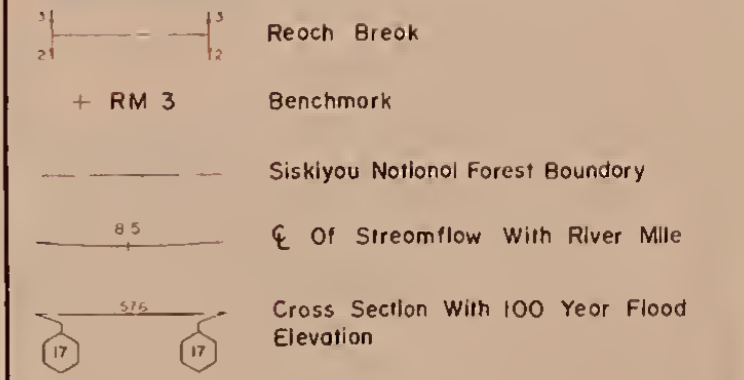
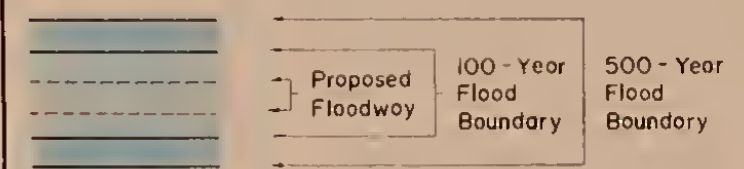
APPENDIX B
PLATE 6 OF 9



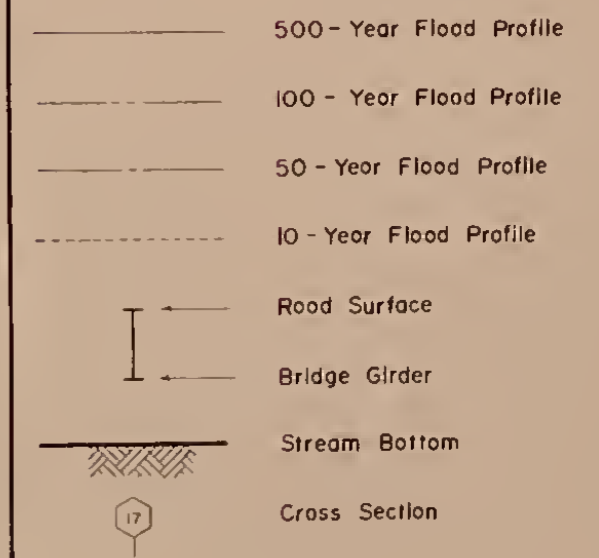


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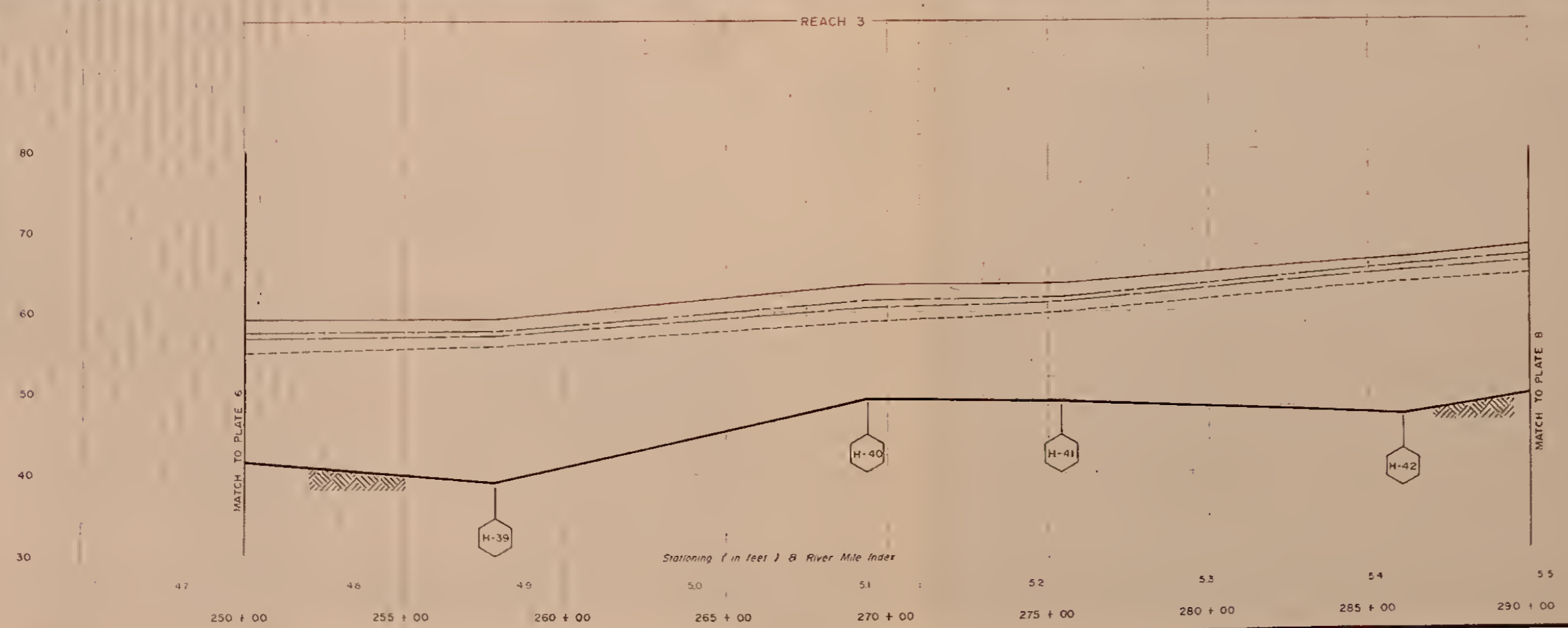
PLAN



PROFILE



Elevation in feet (mean sea level)



U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD MAP
HUNTER CREEK
CURRY COUNTY, OREGON



Photomap base is from Curry County and Siskiyou National Forest 1976 flights
Thematic detail by the Oregon State Staff

APPENDIX B
PLATE 7 OF 9



LEGEND

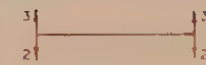
PLAN



Proposed
Floodway

100 - Year
Flood
Boundary

500 - Year
Flood
Boundary



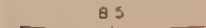
Reach Break

+ RM 3

Benchmark



Siskiyou National Forest Boundary



☒ Of Streamflow With River Mile



Cross Section With 100 Year Flood
Elevation

PROFILE



500 - Year Flood Profile



100 - Year Flood Profile



50 - Year Flood Profile



10 - Year Flood Profile



Road Surface



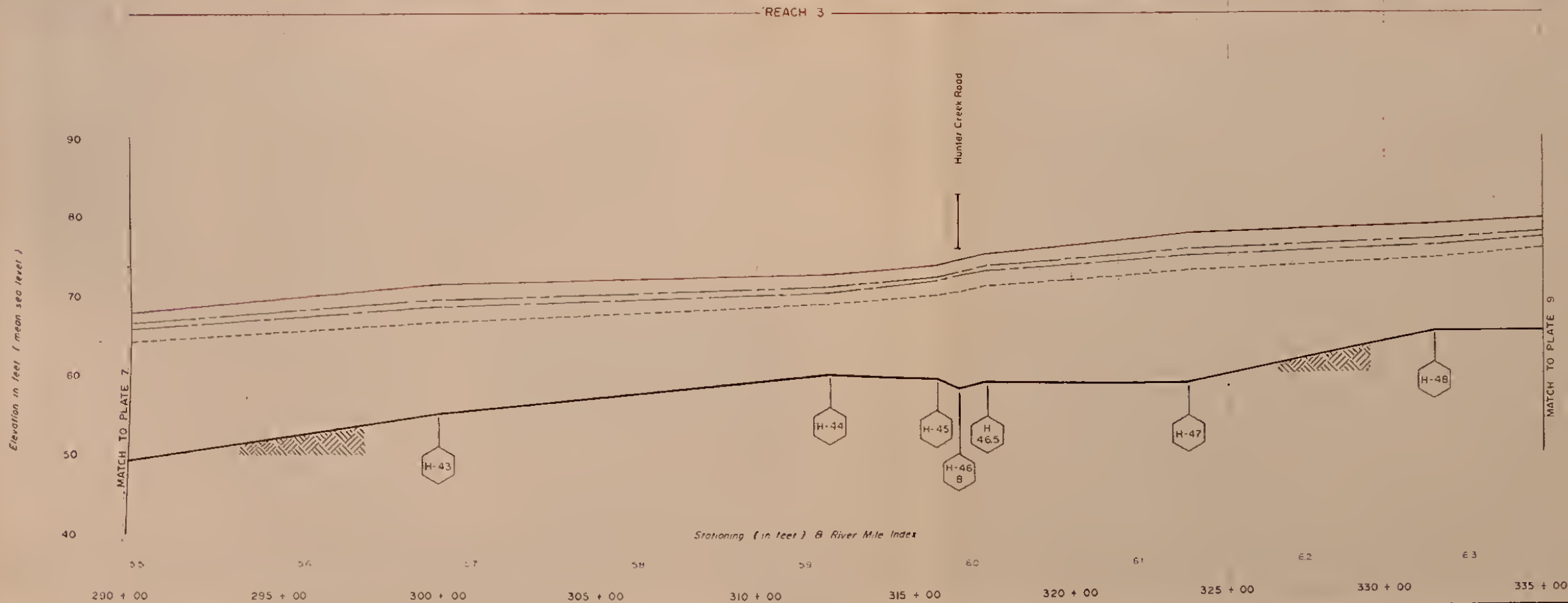
Bridge Girder



Stream Bottom



Cross Section



U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD HAZARD MAP HUNTER CREEK CURRY COUNTY, OREGON



Photomap base is from Curry County and Siskiyou
National Forest 1976 flights
Thematic detail by the Oregon State Staff

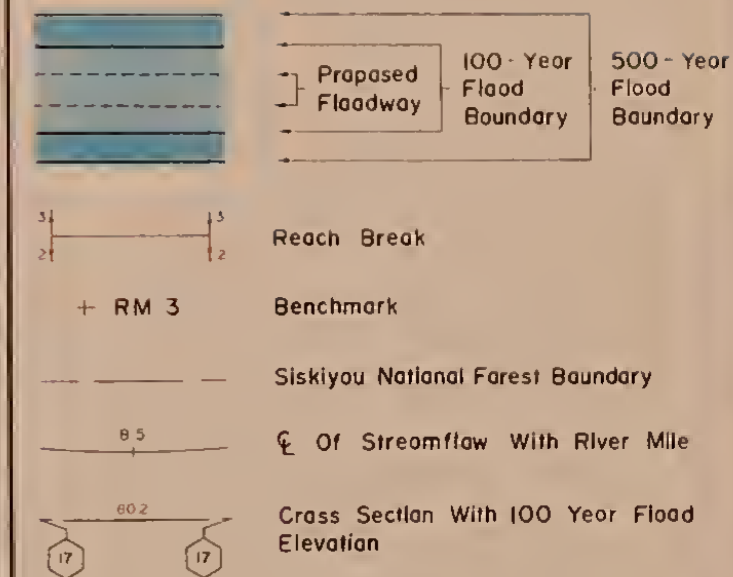
APPENDIX B
PLATE B OF 9



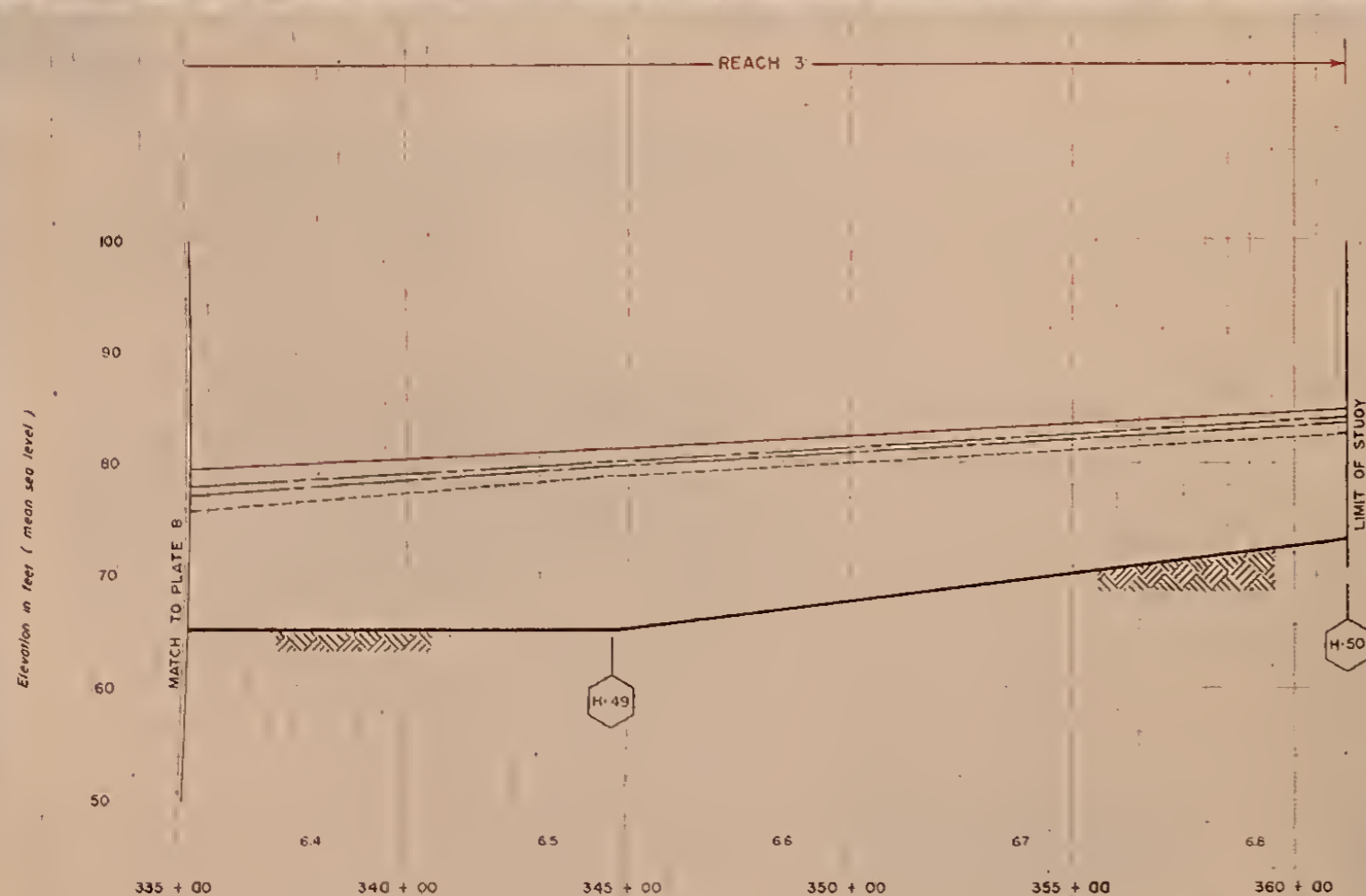
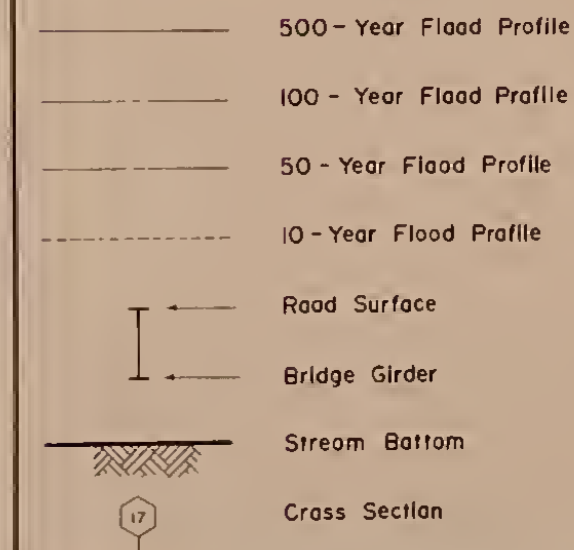


LEGEND

PLAN



PROFILE



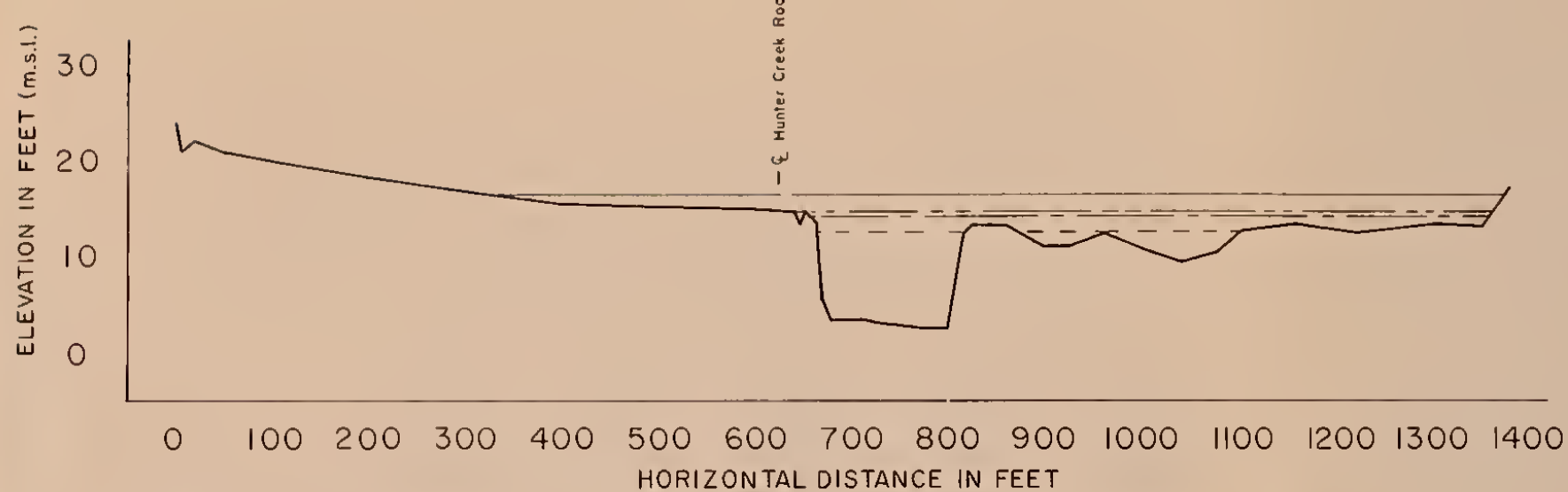
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD HAZARD MAP HUNTER CREEK CURRY COUNTY, OREGON

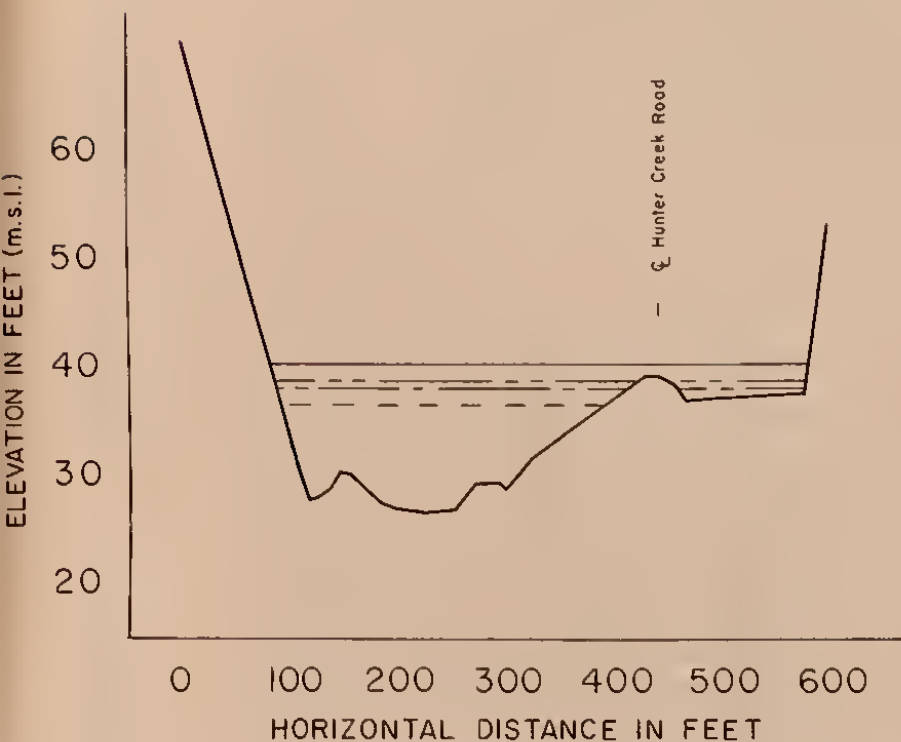


Photomap base is from Curry County and Siskiyou
National Forest 1976 flights.
Thematic detail by the Oregon State Staff

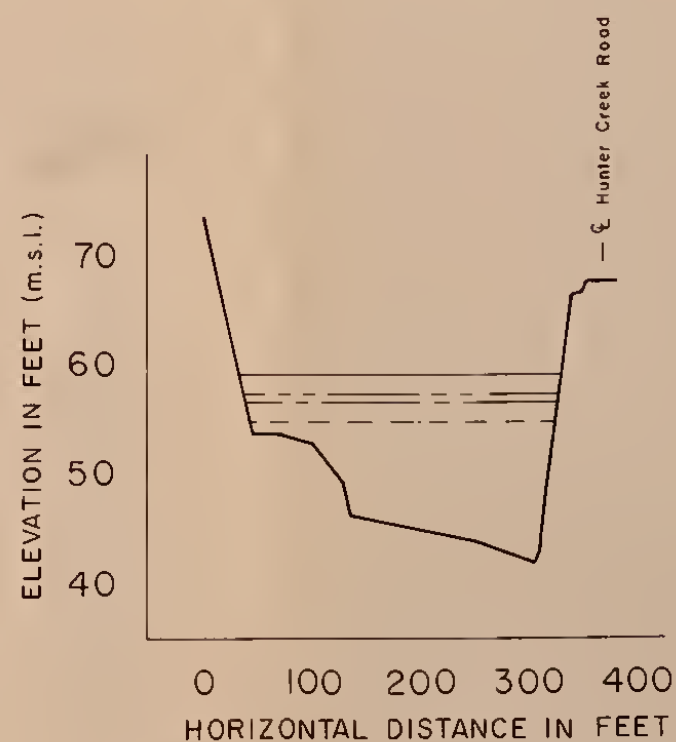
APPENDIX B
PLATE 9 OF 9



REACH 1 Section number 8. Located at river mile 0.7 near the Hunter Creek Store.



REACH 2 Section number 24. Located 1.6 miles south east along Hunter Creek Road from U.S. Highway 101 near river mile 3.2.



REACH 3 Located 2.85 miles south east along Hunter Creek Road from U.S. Highway 101 at river mile 4.7.

LEGEND

| | |
|-----------|-------------------------|
| ————— | 0.2% (500 Year) Profile |
| ----- | 1.0% (100 Year) Profile |
| - - - - - | 2.0% (50 Year) Profile |
| - - - - - | 10.0% (10 Year) Profile |
| ————— | Ground Line |

APPENDIX C

TYPICAL VALLEY CROSS SECTIONS

HUNTER CREEK
FLOOD HAZARD STUDY

CURRY COUNTY, OREGON

TABULATION OF DISCHARGE FREQUENCY DATA

| Cross Sections | | Discharges (cfs) | | | | |
|----------------|------|------------------|---------|---------|----------|----------|
| From | To | 2-year | 10-year | 50-year | 100-year | 500-year |
| H-1 | H-25 | 7100 | 14200 | 18200 | 20200 | 24900 |
| H-26 | H-50 | 6600 | 13300 | 17100 | 19000 | 23400 |

TABULATION OF WATER SURFACE ELEVATIONS

SEA LEVEL DATUM (SLD)

| Cross Section No. | Station (feet) | Channel Bottom Elevation | Water Surface Elevations - feet | | | |
|-------------------------|-------------------|--------------------------------|---------------------------------|----------------|-----------------|-------------------|
| | | | 10% (10 Yr.) | 2% (50 Yr.) | 1% (100 Yr.) | 0.2% (500 Yr.) |
| Reach #1 | | | | | | |
| H-2B | 7 + 50 | -1.70 | 9.9 | 11.2 | 11.8 | 13.6 |
| H-3 | 10 + 50 | -3.8 | 10.1 | 11.5 | 12.1 | 13.8 |
| H-4 | 16 + 00 | 0.1 | 10.3 | 11.6 | 12.3 | 13.9 |
| H-5 | 26 + 20 | 0.2 | 10.8 | 12.0 | 12.7 | 14.2 |
| H-6B | 27 + 75 | -5.8 | 11.0 | 12.3 | 12.9 | 14.5 |
| | | | 11.1 | 12.3 | 12.9 | 14.5 |
| H-7 | 28 + 40 | -4.8 | 11.1 | 12.3 | 12.9 | 14.5 |
| H-8 | 38 + 50 | 2.8 | 12.5 | 14.0 | 14.7 | 16.3 |
| H-9 | 48 + 95 | 1.5 | 14.2 | 15.1 | 15.4 | 16.3 |
| H-10 | 58 + 40 | 3.8 | 16.1 | 17.6 | 18.3 | 20.0 |
| H-11 | 75 + 25 | 7.4 | 18.8 | 20.1 | 20.8 | 22.2 |
| H-12 | 85 + 75 | 9.9 | 20.4 | 21.6 | 22.5 | 24.0 |
| H-13 | 98 + 35 | 12.2 | 23.1 | 24.4 | 25.0 | 26.2 |
| H-14 | 102 + 85 | 9.5 | 23.6 | 24.7 | 25.1 | 26.1 |
| H-15 | 109 + 30 | 14.7 | 24.2 | 25.1 | 25.5 | 26.1 |
| H-16 | 118 + 45 | 8.1 | 26.0 | 27.0 | 27.4 | 30.2 |

Reach #2

| | | | | | | |
|-------|----------|------|------|------|------|------|
| H-17 | 125 + 55 | 14.5 | 28.6 | 30.6 | 31.5 | 33.0 |
| H-18B | 126 + 65 | 14.4 | 28.9 | 30.8 | 31.8 | 33.5 |
| | | | 31.6 | 33.9 | 35.1 | 36.9 |
| H-20 | 127 + 65 | 16.8 | 31.6 | 33.9 | 35.1 | 36.9 |
| H-21 | 133 + 65 | 15.0 | 31.9 | 34.0 | 35.2 | 36.9 |

| Cross Section No. | Station (feet) | Channel Bottom Elevation | Water Surface Elevations - feet | | | |
|-------------------------|-------------------|--------------------------------|---------------------------------|----------------|-----------------|-------------------|
| | | | 10% (10 Yr.) | 2% (50 Yr.) | 1% (100 Yr.) | 0.2% (500 Yr.) |
| H-22 | 147 + 15 | 20.2 | 33.7 | 35.8 | 36.8 | 38.6 |
| H-23 | 157 + 80 | 20.5 | 34.3 | 36.1 | 37.0 | 38.7 |

Reach #3

| | | | | | | |
|--------|----------|------|------|------|------|------|
| H-24 | 169 + 90 | 26.5 | 36.6 | 38.0 | 38.7 | 40.1 |
| H-25 | 178 + 40 | 23.5 | 38.2 | 39.3 | 39.8 | 40.8 |
| H-26 | 185 + 60 | 21.8 | 40.0 | 41.3 | 41.9 | 43.1 |
| H-27B | 186 + 70 | 25.6 | 40.0 | 41.3 | 41.9 | 44.8 |
| H-28 | 187 + 35 | 24.4 | 40.0 | 41.3 | 41.9 | 44.8 |
| H-29 | 202 + 15 | 32.1 | 42.8 | 44.3 | 45.0 | 46.4 |
| H-30 | 210 + 65 | 35.7 | 44.3 | 45.3 | 45.8 | 46.7 |
| H-31 | 221 + 23 | 35.5 | 46.9 | 47.9 | 48.4 | 52.3 |
| H-32B | 222 + 33 | 35.5 | 48.0 | 49.7 | 50.6 | 53.4 |
| | | | 49.3 | 50.8 | 51.4 | 53.4 |
| H-33 | 223 + 83 | 33.2 | 52.0 | 53.7 | 54.6 | 56.7 |
| H-34 | 230 + 91 | 39.0 | 52.9 | 54.8 | 55.7 | 57.8 |
| H-35 | 237 + 51 | 41.0 | 53.0 | 55.6 | 56.5 | 58.3 |
| H-36B | 238 + 41 | 33.6 | 53.1 | 56.0 | 56.9 | 58.5 |
| H-37 | 240 + 46 | 41.8 | 54.4 | 56.4 | 57.3 | 59.1 |
| H-38 | 248 + 36 | 42.0 | 54.8 | 56.6 | 57.3 | 59.1 |
| H-39 | 257 + 76 | 38.9 | 55.7 | 57.0 | 57.6 | 59.1 |
| H-40 | 269 + 36 | 49.3 | 59.0 | 60.8 | 61.6 | 63.6 |
| H-41 | 275 + 36 | 49.0 | 60.1 | 61.4 | 62.0 | 63.7 |
| H-42 | 286 + 01 | 46.4 | 63.3 | 64.7 | 65.3 | 66.3 |
| H-43 | 299 + 86 | 55.3 | 66.8 | 68.7 | 69.6 | 71.6 |
| H-44 | 312 + 26 | 59.4 | 69.1 | 70.5 | 71.2 | 72.8 |
| H-45 | 315 + 66 | 59.7 | 70.1 | 72.0 | 72.4 | 73.9 |
| H-46B | 316 + 36 | 58.3 | 70.7 | 72.7 | 73.0 | 74.6 |
| H-46.5 | 317 + 26 | 58.4 | 71.3 | 73.3 | 73.8 | 75.4 |
| H-47 | 323 + 66 | 59.0 | 73.2 | 75.1 | 76.0 | 77.9 |
| H-48 | 331 + 51 | 65.2 | 74.6 | 76.2 | 77.0 | 78.8 |
| H-49 | 344 + 51 | 65.1 | 79.0 | 79.8 | 80.2 | 81.4 |
| H-50 | 360 + 11 | 73.4 | 82.8 | 83.8 | 84.2 | 85.0 |

INVESTIGATIONS AND ANALYSES

Field surveys of the stream and valley cross sections were completed in 1979. These surveys were of Third order accuracy. There were 51 cross sections surveyed including seven bridge sections. High water marks from historic floods were located from interviews with local residents. Thirteen high water marks from 5 different storms were identified. The elevation of these high water marks was determined by field survey. U. S. Geological Survey sea level datum was used for all of the surveying.

HYDROLOGIC ANALYSIS

Records of twelve streamgages were investigated for use in a regional analysis. Eight of these gages were within the drainage area size needed for Hunter Creek study and were used in this analysis. The eight gages were; South Fork Coquille River above Panther Creek, South Fork Coquille River near Illahe, South Fork Coquille River near Powers, North Fork Coquille River near Fairview, Jones Creek near Grants Pass, East Fork Illinois River near Takilma, Sucker Creek below Little Grayback Creek near Holland, West Fork Illinois River below Rock Creek near O'Brien. A discharge frequency relationship was developed for each of these gages using a log-Pearson Type 3 statistical procedure. This procedure is outlined in the Water Resources Council Bulletin No. 17A, "Guidelines for Determining Flood Flow Frequency." Using the data from these analyses a regression equation was developed of discharge versus drainage area was devised for each of the frequency storms.

A further analysis by flood routing was made of the watershed in which the watershed was divided into sub-watersheds, and hydrographs developed and floodrouted to the outlet. The procedure used is from SCS Technical Release No. 20, Project Formulation Program - Hydrology. Input to this program includes rainfall data attained from rainfall-duration-probability maps, hydrologic soil types, average slope of the watershed and streambed, land use and stream cross section data.

The results obtained from the two methods of analysis were compared. The discharges calculated from the TR 20 computer program were used, since this procedure recognized the stream configuration, slope & cover conditions within the watershed.

HYDRAULIC ANALYSIS

The flood elevations for the various frequency storms were determined using water surface profile analysis. SCS Technical Release No. 61, WSP-2 Computer Program was used in developing these profiles. This program uses the standard step method for running backwater curves. Survey data from the 51 cross section was used as input to the program. The channel and floodplain distances between each cross section was measured on the aerial photographs. Roughness coefficients (n-values) were determined in the field.

The starting elevation at the mouth of the river normally would be mean higher high tide. Tide information was obtained for Gold Beach, Oregon from the Tides Branch of the National Oceanic and Atmospheric Administration (NOAA). The water surface profile program determined that mean higher high water ele-

vation was lower than critical flow for all discharges studied. Therefore, critical depth was the starting elevation in this study for each of the frequencies.

The velocity and elevation at each cross section for the 2-, 10-, 50-, 100-, and 500-year flood events was determined from the WSP-2 program. Flood elevations calculated were compared with the high water information from historic floods. There was a consistent relationship between the data which increased the validity of the analyses.

The 100-year and 500-year flood area inundated were located on the aerial photomaps using the survey cross sections. The extent of flooding was field checked using the flood elevations. Area inundated between cross sections was determined by field survey using interpolated flood elevations.

Floodway was determined using SCS Technical Release No. 64, Floodway Determination Computer Program. This gave the floodway width and location on the cross section of the stream. Location of the floodway between cross sections was determined by field observation and map analysis.

REFERENCE MARK DESCRIPTIONS

Hunter Creek FHA

| Reference Mark | Elevation in feet | Description of Location |
|-------------------|-------------------|--|
| RM-1 | 30.29 | (OSHD) About 1.6 miles south of Gold Beach in the curb at the N.E. corner of the Hwy. 101 bridge over Hunter Creek. An OSHD brass cap with no data available. Elev. by 3rd order survey, Soil Conservation Service, 1979. |
| RM-2 Panel 1 | 25.886 | (OSHD) (OSHD level line 73, p. 10). About 2.2 miles south of Gold Beach along Hwy. 101 and Hunter Creek Road. In curb at N.W. corner of "old" Hwy. 101 bridge, a brass cap stamped "Q42 1931." |
| RM-3 Panel 3 | 31.35 | (Curry County) About 3.1 miles south of Gold Beach along Hwy. 101 and Hunter Creek Rd. At the Curry County Road Department yard. 32 ft. N. of north gatepost (Treated Weed), 3 ft. above yard. A brass disk in a concrete post. Cap is stamped "Curry Co. HC.1 1979." A witness post set. |
| RM-4 Panel 4 | 36.92 | (Curry County) 0.9 miles S.E. along Hunter Creek Rd. from south intersection with Hwy. 101. In curb at S.W. corner of bridge. A brass disk set flush to curb and stamped "Curry Co. HC 2 1979." |
| RM-5 Panel 5 | 55.27 | (Curry County) 1.9 miles S.E. along Hunter Creek Rd. from south intersection with Hwy. 101. 68 ft. N.W. from N. end of a 16" CMP culvert, 25.5 ft. N. from the centerline of Hunter Creek Rd., 1.5 feet south of a wire fence, 0.2 ft. below ground line in a concrete post. A brass disk stamped "Curry County HC. 2.5 1979." Witness post set. |
| RM-6 Panel 6,7 | 68.81 | (Curry County) 2.7 miles S.E. along Hunter Creek Rd. from the south intersection with Hwy. 101. 28 feet N. of the centerline of road and 1.5 feet above road. A brass cap set in a concrete post. Cap stamped "Curry Co. HC.3 1979." Witness post set. |

| Reference Mark | Elevation in feet | Description of Location |
|-------------------|----------------------|---|
| RM-7 Panel 8 | 83.23 | (Curry County) 3.8 miles S.E. along Hunter Creek Rd. from the south intersection with Hwy. 101. Flush in curb at S.E. corner of a bridge over Hunter Creek. A brass disk stamped "Curry Co. HC.4 1979." |

Note: All "Curry County" marks listed were established and surveyed by SCS in 1979, 3rd order levels.

GLOSSARY OF TERMS

| | |
|------------------------|--|
| <u>Flood</u> | An overflow or inundation that comes from a river or other body of water and causes or threatens damage. |
| <u>Flood Crest</u> | The maximum height of the water surface during a flood. This may or may not be the maximum discharge (cfs). |
| <u>Flood Frequency</u> | <p>An expression of how often a hydrologic event of given size or magnitude should, on an average, be equaled or exceeded.</p> <p>100-year flood is the size of flood which will be equaled or exceeded, on the average, of once in 100 years or a one percent chance in any one year.</p> |
| <u>500-Year Flood</u> | A flood which will be equaled or exceeded, on the average, once in 500 years. It is included to indicate an extreme flood. |
| <u>Flood Hazard</u> | The risk to life or damage to property from overflows of the river or stream channel; flood flow in intermittent or normally dry streams, floods on tributary streams; floods caused by accumulated debris or ice in rivers; or other similar events. |
| <u>Floodplain</u> | The area adjoining a river, stream, watercourse, ocean, bay or lake, which has been inundated by a flood or can be reasonably expected to be so inundated in the future. |
| <u>Flood Proofing</u> | A combination of structural provisions, changes, or adjustments to properties and structures subject to flooding primarily for the reduction or elimination of flood damages to properties, water and sanitary facilities, structures, and contents of buildings in a flood hazard area. |
| <u>Floodway</u> | The portion of a floodplain consisting of the stream channel and overbank areas capable of conveying the 100 year flood discharge without increasing its water surface elevation more than one foot. |

| | |
|--------------------------------------|--|
| <u>Floodway Fringe</u> | The area that comprises that portion of the floodplain that is between the floodway and the 100-year flood boundary line. |
| <u>Hydrologic Soil Group</u> | Hydrologic Soil Groups are used to estimate the runoff amount from a rainfall. There are four (4) soil groups, A,B,C, & D. The A group has the lowest runoff potential and the D group has the highest runoff potential. |
| <u>Mean Higher High Water (MHHW)</u> | The average height of the higher of the daily high tides over a 19 year period. |
| <u>Percent Chance Flood</u> | See Flood Frequency. |
| <u>Return Interval</u> | An alternate term to express flood frequency. |
| <u>Sea Level Datum (SLD)</u> | The full title is the "Sea Level Datum of 1929 Through the Pacific Northwest Supplementary Adjustment of 1947." A standard adopted for measuring elevations, which is based upon the average height of the sea for all stages of the tide over a 19 year period. |
| <u>Water Surface Profile</u> | A graph showing the relationship of water surface elevation to location, the latter generally expressed as distance above mouth for a stream of water flowing in an open channel. It is generally drawn to show surface elevation for the crest of a specified flood, but may be prepared for conditions at a given time or stage. |

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